

## **Technical Exhibit 25**

# **Comprehensive Everglades Restoration Program**

The purpose of this exhibit is to provide prospective Service Providers insight into the scope and complexity of this mission.

This Technical Exhibit provides information regarding the unique missions and the incumbent's estimated workload of IMIT responsibilities in support of the Interagency Modeling Center (IMC) and the Comprehensive Everglades Restoration Program (CERP) managed by the USACE Jacksonville District.

This data was collected in 2004 and 2005. It is not all-inclusive and may not precisely represent the situation at the time of the advertisement of the solicitation.



# CERP INFORMATION TECHNOLOGY INITIATION FORM



SFWMD

USACE

CERP Number \_\_\_\_\_

<b>Requestor:</b>	
<b>Approval:</b>	
<b>Date:</b>	
<b>Phone:</b>	
<b>Email Address:</b>	
<b>Funding Approver:</b>	
<b>Subject:</b>	
<b>Describe the Business Problem and User Requirements:</b>	
<b>Describe Current Process and Existing Technology if any:</b>	
<b>Describe Shortfalls of Current Process/Technology:</b>	
<b>Describe the implications (Risks) if not implemented:</b>	
<b>IT Evaluation of Requirements:</b>	
<b>IT Review</b> _____ <b>Date</b> _____ <b>USACE</b> _____ <b>Date</b> _____	
<b>Approval to Proceed SFWMD CIO:</b> _____ <b>Date:</b> _____	
<b>Approval to Proceed USACE CIO:</b> _____ <b>Date:</b> _____	

# TECHNOLOGY INITIATION FORM INSTRUCTIONS

Please complete this form prior to any technology acquisition that will connect to the CERP infrastructure or impact the technology direction of CERP.

Please complete this form in its entirety.

## **The originator shall complete this form as follows:**

### **First Section** (Should have requestor information from both agencies):

**Requestor:** Person and other Agency concurring counterpart responsible for this initiative

**Approval:** Signature of Requestors

**Date:** Date of this request/concurrence

**Phone:** Phone number of requestors

**Email Address:** Email address of the requestors

**Funding Approver:** Signature and date for each agency

### **Second Section:**

**Describe the Business Problem and User Requirements:** Describe the business problem and any known requirements that will be addressed by this initiative.

**Describe Current Process and Existing Technology if any:** Describe the current manual or automated process that this initiative will address.

**Describe Shortfalls of Current Process/Technology:** What is lacking and/or is not working. To what degree are you enhancing the current technology?

**Describe the implications (Risks) if not implemented:** What is the impact if this initiative is not approved.

## **The Information Technology Office shall complete this Section**

### **Third Section:**

**IT Evaluation of Requirements:** Identify any automation requirements that need to be satisfied by this initiative.

**IT Review:** Signature and date of CERP IT Project Managers of each agency

**Approval to Proceed SFWMD CIO:**

**Approval to Proceed USACE CIO:**

4. See Page 3 for document coordination.

## **DOCUMENT COORDINATION**

### **1. Requestor will**

**complete sections One and Two.**

**print and sign the Requestor approval section.**

**Fax or overnight mail the printed signed form to the counterpart requestor in the other organization.**

**When both requestors' signatures are on the document, the document will be delivered to the CERP IT Project Manager in their respective organization.**

**SFWMD - Bill Hall**

**USACE - Barbara Burch**

**2. Upon receipt of request signed by both requestors, the receiving CERP IT Project Manager will fax or overnight a signed copy to their counterpart.**

**IT evaluators will be identified and given copies of the request to review.**

**Request will be discussed at next available CERP IT weekly meeting.**

**IT evaluation will be discussed and course of action agreed upon by both agencies.**

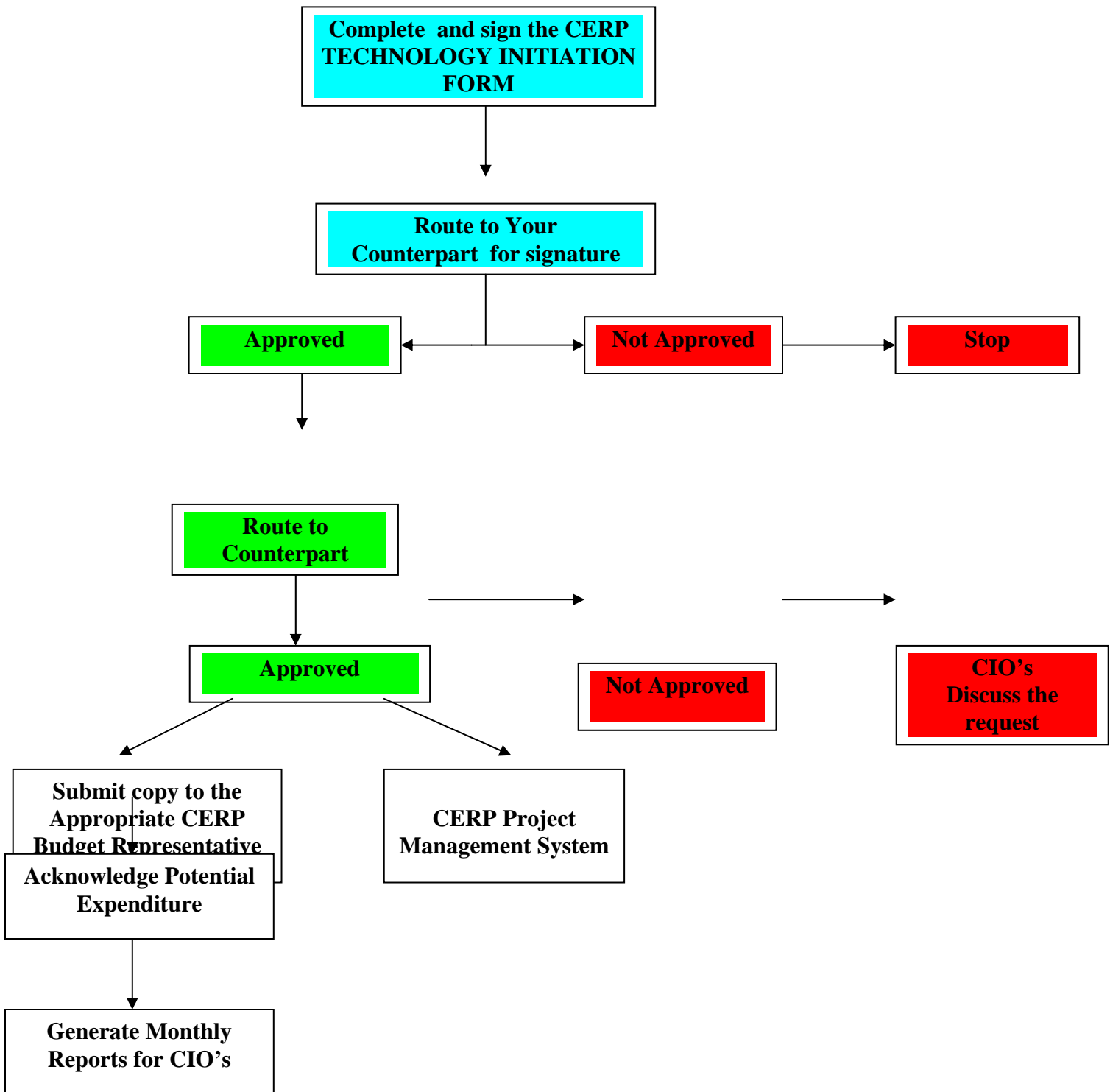
**Agreed IT evaluation and cost estimate will be added to the form.**

**3. Budget approvals and Requestor Authorization. Form will be returned to both requestors with proposed solution and cost estimate. Requestors from each agency will initial & date the form next to their "Budget Source" line, returning to the CERP IT Project Manager in their respective organization.**

**4. Form will be coordinated and presented to CIOs at both agencies for signature.**

**5. Requestor will be notified via e-mail of recommendations and approval if appropriate.**



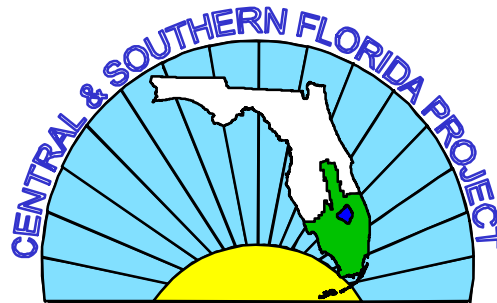


AUGUST 2000

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# MASTER PROGRAM MANAGEMENT PLAN VOLUME I – MANAGEMENT PROCESSES

## COMPREHENSIVE EVERGLADES RESTORATION PLAN



COMPREHENSIVE EVERGLADES  
RESTORATION PLAN



U.S. Army Corps of Engineers  
Jacksonville District



South Florida  
Water Management District

## MASTER PROGRAM MANAGEMENT PLAN

### U.S. Army Corps of Engineers and the South Florida Water Management District Approvals:



**RICHARD E. BONNER, P.E.**  
Deputy District Engineer for  
Project Management  
Jacksonville District, USACE

Date: 24 August 00



**MICHAEL COLLINS**  
Chairman, Governing Board  
South Florida Water Management District

Date: 8/19/00

**Comprehensive Everglades Restoration Plan  
Master Program Management Plan  
Volume I - Management Processes**

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## **1.0 Introduction**

The purpose of this Master Program Management Plan (Master Plan) is to describe the framework and process to be used by the U.S. Army Corps of Engineers (Corps) and the South Florida Water Management District (SFWMD) for managing and monitoring implementation of the Comprehensive Everglades Restoration Plan (Comprehensive Plan). This document provides the Corps and the SFWMD with a common understanding of the business processes and protocols to be applied during implementation of the Comprehensive Plan. For this Master Plan the term program refers to the Comprehensive Plan projects for which the SFWMD is the local sponsor.

The Comprehensive Plan was developed to accomplish a set of system-wide goals and objectives. Due to size and complexity, implementation of the Comprehensive Plan requires that it be divided into smaller implementable packages of components that are referred to as projects. As these projects are further planned and designed, analyses and evaluations that measure each package's overall contribution to system-wide goals will be conducted to determine and, thus, ensure that the system-wide goals and benefits of the Comprehensive Plan are being realized. This process will allow the Comprehensive Plan to be refined and revised, as necessary, as part of the adaptive assessment process.

In this document, the program has been separated into 1) program-level activities and 2) project-level activities. Program-level activities are defined as any work that spans multiple projects and system-wide issues. The program-level activities include Restoration Coordination and Verification (RECOVER), public outreach, socioeconomic and environmental justice, and program management and control tasks. For the project-level activities, this document describes the process for developing Project Management Plans for each component or group of components, Pilot Project Design Reports, Project Implementation Reports, Design Documentation Reports, plans and specifications, and project cooperation agreements. This Master Plan also addresses real estate acquisition procedures, preparation and processing of application for permits, and construction guidelines including preparation of operational plans, water control plans and water control manuals.

This document is written in two volumes. Volume I includes 1) a background and overview of the program, 2) program and project management guidelines and a structure for implementing the Comprehensive Plan, 3) a description of products and approval authorities necessary for project development, and 4) a description of the program-level tasks associated with the system-wide activities (activities that are not specifically linked to a particular project). Volume II, the Annual Report and Work Plan, provides an update on progress made during the previous year and a summary of program-level and project-level work planned for the upcoming two fiscal years, and a set of project summaries for all projects for which design is ongoing.

### **1.1 Program Goal**

The south Florida ecosystem is a nationally and internationally unique and important natural resource. It is also a resource in peril, having been severely impacted by human activities for

over a hundred years. The “Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement” (April 1999 Final Feasibility Report) recommends a comprehensive plan for the restoration, protection and preservation of the water resources of central and southern Florida. This plan is known as the Comprehensive Everglades Restoration Plan. The primary goal of this Comprehensive Plan is the restoration, preservation and protection of the south Florida ecosystem while providing for other water-related needs of the region such as flood protection and water supply. The plan contains 68 major components that involve creation of approximately 217,000 acres of reservoirs and wetland-based water treatment areas. These components will vastly increase storage and water supply for the natural system, as well as for urban and agricultural needs, while maintaining current Central and Southern Florida Project purposes. The Comprehensive Plan will restore more natural flows of water, including sheet flow; improve water quality; and establish more natural hydroperiods in the south Florida ecosystem. Improvements to native flora and fauna, including threatened and endangered species, will occur as a result of the restoration of hydrologic conditions.

Implementing the Comprehensive Plan will require a well-coordinated strategy that, like the plan itself, is based on a set of principles that recognize ecosystem restoration is the overarching objective. This objective will be the principle driving force behind the sequence and pace at which the Corps and the SFWMD undertake the specific project features. Implementation of the Comprehensive Plan will require integration of many related projects and activities. This Master Plan provides the processes for an intense and innovative program management effort necessary to implement the Comprehensive Plan.

While the purpose of this Master Plan is to provide an overall management strategy to implement the Comprehensive Plan, activities associated with project implementation are limited to the components for which the SFWMD has agreed to be the local sponsor. The remaining components will be implemented through other programs, such as the Critical Restoration Projects authority, or will be implemented under separate Design Agreements and Project Management Plans with appropriate local sponsors.

## **1.2 Authority**

The authority for this Master Plan is contained within the “Design Agreement between the Department of the Army and the SFWMD for the Design of Elements of the Comprehensive Plan for the Everglades and South Florida Ecosystem Restoration Project” (Design Agreement).

Section 528 of the Water Resources Development Act of 1996 includes additional direction and guidance for conducting studies after completion of the feasibility report. The provisions of Section 528 concerning continuing studies are:

*(b) RESTORATION ACTIVITIES-*

*(1) COMPREHENSIVE PLAN-*

*(A) DEVELOPMENT-*

*(i) PURPOSE- The Secretary shall develop, as expeditiously as practicable, a proposed Comprehensive Plan for the purpose of restoring, preserving, and protecting the South Florida*



*ecosystem. The Comprehensive Plan shall provide for the protection of water quality in, and the reduction of the loss of fresh water from, the Everglades. The Comprehensive Plan shall include such features as are necessary to provide for the water-related needs of the region, including flood control, the enhancement of water supplies, and other objectives served by the Central and Southern Florida Project.*

*(ii) CONSIDERATIONS- The Comprehensive Plan shall--*

*(I) Be developed by the Secretary in cooperation with the non-Federal project sponsor and in consultation with the Task Force; and*

*(II) Consider the conceptual framework specified in the report titled Conceptual Plan for the Central and Southern Florida Project Restudy," published by the Commission and approved by the Governor.*

*(B) SUBMISSION- Not later than July 1, 1999, the Secretary shall--*

*(i) Complete the feasibility phase of the Central and Southern Florida Project comprehensive review study as authorized by section 309(l) of the Water Resources Development Act of 1992 (106 Statute. 4844), and by two resolutions of the Committee on Public Works and Transportation of the House of Representatives, dated September 24, 1992; and*

*(ii) Submit to Congress the plan developed under subparagraph (A)(i) consisting of a feasibility report and a programmatic environmental impact statement covering the proposed Federal action set forth in the plan.*

*(C) ADDITIONAL STUDIES AND ANALYSES- Notwithstanding the completion of the feasibility report under subparagraph (B), the Secretary shall continue to conduct such studies and analyses as are necessary, consistent with subparagraph (A)(i).*

Further, the Water Resources Development Act of 1999 included specific language on the in-kind work accomplished by the local sponsor. Section 528(e)(4) CREDIT- of the Water Resources Development Act of 1999 states:

*(2) IN-KIND WORK -*

*(A) IN GENERAL - During the preconstruction, engineering, and design phase and the construction phase of the Central and Southern Florida Project, the Secretary shall allow credit against the non-Federal share of the cost of activities described in subsection (b) for work performed by non-Federal interests at the request of the Secretary in furtherance of the design of features included in the comprehensive plan under that subsection. (B) AUDITS - In-kind work to be credited under subparagraph (A) shall be subject to audit.*

### **1.3 Federal Authorization**

The Final Integrated Feasibility Report and Programmatic Environmental Impact Statement was transmitted to Congress on July 1, 1999. It is currently anticipated that Congress, through enactment of a Water Resources Development Act of 2000, will approve the Comprehensive Everglades Restoration Plan as a framework and guide for authorization and implementation of the program. It is also anticipated that Congress will authorize the four pilot projects (two pilot projects were authorized in the Water Resources Act of 1999) and an initial set of 10 projects in Water Resources Development Act of 2000. The remaining projects would be authorized under a new programmatic authority, similar to the existing Critical Restoration Projects authority, or would be authorized in subsequent Water Resources Development Acts.

## **1.4 South Florida Water Management District Authorization**

During the 1999 legislative session, Florida lawmakers created Section 373.1501 of the Florida Statutes and amended Section 373.026 of the Florida Statutes. Section 373.1501 of the Florida Statutes provides a legislative finding that the Comprehensive Plan is important for restoring the Everglades ecosystem and for sustaining the environment, economy and social well-being of south Florida. Its purpose is to facilitate and support the Comprehensive Plan through an approval process concurrent with Federal government review and congressional authorization. Further, this section ensures that all project components are implemented through appropriate processes and are consistent with the balanced policies and purposes of Chapter 373 of the Florida Statutes, specifically Section 373.026. Section 373.026 (8)(b) directs the Florida Department of Environmental Protection to collaborate with the SFWMD and to approve each project component, with or without amendments, within a specified time frame.

In the 2000 legislative session, the Florida Legislature created an act relating to Everglades restoration and funding, amending Section 215.22 of the Florida Statutes and creating Section 373.470 which is cited as the “Everglades Restoration Investment Act.” The purpose of this act is to establish a full and equal partnership between the state and the Federal governments for the implementation of the Comprehensive Plan. This act requires that a Project Implementation Report be approved in accordance with Section 373.026 of the Florida Statutes before the SFWMD and the Corps execute a Project Cooperation Agreement.

## **1.5 Partnership**

The U.S. Army Corps of Engineers is the Federal government’s largest water resources development agency. Congress assigned the Corps civil works responsibility for the Central and Southern Florida Project in an effort to conserve and protect one of the nation’s most valuable natural resources. Following the disastrous flood in 1947, the problems of south Florida came to a climax. The flood, coupled with the experiences of the drought in 1945 and the intrusion of salt water, made it imperative that immediate corrective action be started. Acting upon the requests of many local agencies concerned with flood control and water conservation, the Corps’ Jacksonville District developed the Central and Southern Florida Project, a comprehensive plan for flood control and water conservation, which would be constructed by the Corps, with local cooperation. Congress approved the comprehensive report and authorized construction of the first phase of the Central and Southern Florida Project as part of the Flood Control Act of June 30, 1948.

In 1949, the Florida Legislature created the Central and Southern Florida Flood Control District to act as the local sponsor for the Central and Southern Florida Project. This Flood Control District is the predecessor to the SFWMD. The SFWMD now operates and maintains most of the Central and Southern Florida Project, which today includes 1,800 miles of canals and levees, 16 major pumping stations and approximately 150 water control structures. The SFWMD spans 16 counties with a total population of over six million residents. This geographic region covers 18,000 square miles and includes vast areas of agricultural lands, water conservation areas, and areas of enormous urban growth and development. The SFWMD provides flood control

protection and water supply protection to residents living and working in cities or on farms within this region, and is working in partnership with the Corps to restore and manage ecosystems from the Kissimmee River to Florida Bay.

Since their initial collaboration on the Central and Southern Florida Project, the Jacksonville District Corps of Engineers and the SFWMD have been working together to implement and operate the Central and Southern Florida Project. However, implementation of the Comprehensive Plan under this agreement will take the Corps and the SFWMD to a higher level of partnering. For the first time in the Central and Southern Florida Project history, the Corps and the SFWMD will be sharing the responsibility for designing and constructing projects. Under the Design Agreement, the SFWMD will have the authority to develop Project Management Plans, conduct studies, write Project Implementation Reports, prepare Design Documentation Reports and develop plans and specifications. While these products will still be required to meet the Corps' requirements and undergo the same review and approval processes, this new method of sharing project development will require new and innovative business practices to ensure that the Comprehensive Plan is implemented in accordance with all applicable laws and regulations. These new business practices are described in Section 2 of this document. Further, to facilitate implementation of the Comprehensive Plan, the Corps has co-located personnel at the SFWMD Headquarters in West Palm Beach. This satellite office will serve as a key liaison hub for activities related to the Comprehensive Plan.

## **1.6 Program Area**

The program area encompasses approximately 18,000 square miles from Orlando to the Florida Reef Tract with at least 11 major physiographic provinces: the Everglades, Big Cypress, Lake Okeechobee, Florida Bay, Biscayne Bay, the Florida Reef Tract, near shore coastal waters, the Atlantic Coastal Ridge, the Florida Keys, Immokalee Rise and the Kissimmee River Valley. The Kissimmee River, Lake Okeechobee and the Everglades are the dominant watersheds that connect a mosaic of wetlands, uplands and coastal and marine areas. The program encompasses all or part of the following 16 counties: Monroe, Miami-Dade, Broward, Collier, Palm Beach, Hendry, Martin, St. Lucie, Glades, Lee, Charlotte, Highlands, Okeechobee, Osceola, Orange and Polk.

## **1.7 Program Summary**

The Central and Southern Florida Project, which was first authorized by Congress in 1948, is a multipurpose project that provides flood control; provides water supply for municipal, industrial and agricultural uses; prevents salt water intrusion; provides water supply for Everglades National Park; and protects fish and wildlife resources. Construction began in 1950 and was essentially complete in the 1970s although some work is still under way. The primary system includes 1,000 miles of canals, 720 miles of levees, 150 water control structures and 16 major pump stations. Today, the Central and Southern Florida Project is the backbone of south Florida's system of water management providing flood protection and water supply to over six million people and almost 1,000,000 acres of agricultural lands. It encompasses 1,800,000 acres

of Everglades' habitat including Everglades National Park. The SFWMD now largely operates the project.

### **1.7.1 Feasibility Report**

The Central and South Florida Project Comprehensive Review Study, known as the Restudy, was authorized by Section 309(l) of the Water Resources Development Act of 1992 (Public Laws 102-580). This study was also authorized by two resolutions of the Committee on Transportation and Infrastructure, United States House of Representatives, dated September 24, 1992. Further, Section 528 of the Water Resources Development Act of 1996 provided specific direction and guidance for the Restudy.

The purpose of the study was to reexamine the Central and South Florida Project to determine the feasibility of modifying the project to restore the south Florida ecosystem and provide for other water-related needs of the region. Specifically, as required by the authorizing legislation, the study investigated making structural or operational modifications to the Central and South Florida Project for improving the quality of the environment; protecting water quality in the south Florida ecosystem; improving the protection of the aquifer; improving the integrity, capability, and conservation of urban and agricultural water supplies; and improving other water-related purposes.

The following principles guided the development of the Comprehensive Plan:

- The overarching objective of the Comprehensive Plan was the restoration, preservation and protection of the south Florida ecosystem while providing for other water-related needs of the region.
- The Comprehensive Plan was based on the best available science, and independent scientific review will be an integral part of its development and implementation.
- The Comprehensive Plan was developed through an inclusive and open process that engaged all stakeholders.
- All applicable Federal, tribal, state and local agencies were full partners, and their views were considered fully.
- The Comprehensive Plan is a flexible plan that is based on the concept of adaptive assessment, recognizing that modifications will be made in the future based on new information.

The Comprehensive Plan contains 68 components and creates approximately 217,000 acres of reservoirs and wetland-based water treatment areas. Implementation of the plan will vastly increase storage and water supply for the natural system as well as urban and agricultural needs, while maintaining current Central and Southern Florida Project purposes. The Comprehensive Plan will accomplish the following:

***Construct Surface Water Storage Reservoirs.*** A number of water storage facilities are planned north of Lake Okeechobee, in the Caloosahatchee and St. Lucie basins, Everglades Agricultural Area and Water Preserve Areas of Palm Beach, Broward and

Miami-Dade counties. These areas will encompass approximately 181,300 acres and will have the capacity to store 1.5 million acre-feet of water.

***Create Water Preserve Areas.*** Multipurpose water management areas are planned in Palm Beach, Broward and Miami-Dade counties between the urban areas and the eastern Everglades. The Water Preserve Areas will have the ability to treat urban runoff, store water, reduce seepage and improve existing wetland areas.

***Manage Lake Okeechobee as an Ecological Resource.*** Lake Okeechobee is currently managed for many, often conflicting, uses. The lake's regulation schedule will be modified and plan features constructed to reduce both the extremely high and low water levels that damage the lake and its shoreline. Management of intermediate water levels will be improved, while allowing the lake to continue to serve as an important source for water supply. Several plan components and other project elements are included to improve water quality conditions in the lake. A study is recommended to evaluate in detail the dredging of nutrient-enriched lake sediments to help achieve water quality restoration targets, important not only for the lake, but also for downstream receiving bodies.

***Improve Water Deliveries to Estuaries.*** Excess stormwater that is discharged to the ocean and the gulf through the Caloosahatchee and St. Lucie rivers is very damaging to their respective estuaries. The Comprehensive Plan will greatly reduce these discharges by storing excess runoff in surface and underground water storage areas. During times of low rainfall, the stored water can be used to augment flow to the estuaries. Damaging high flows will also be reduced to the Lake Worth Lagoon.

***Establish Underground Water Storage.*** Wells and associated infrastructures will be built to store water in the upper Floridan aquifer. As much as 1.6 billion gallons a day may be pumped down the wells into underground storage zones. The injected freshwater, which does not mix with the saline aquifer water, is stored in a "bubble" and can be pumped out during dry periods. This approach, known as aquifer storage and recovery, has been used for years on a smaller scale to augment municipal water supplies. Since water does not evaporate when stored underground and less land is required for storage, aquifer storage and recovery has some advantages over surface storage. The Comprehensive Plan includes aquifer storage and recovery wells around Lake Okeechobee and in the Water Preserve Areas, and Caloosahatchee Basin.

***Create Treatment Wetlands.*** Approximately 35,600 acres of manmade wetlands, known as stormwater treatment areas, will be built to treat urban and agricultural runoff water before it is discharged to the natural areas throughout the system. Stormwater treatment areas are included in the Comprehensive Plan for basins draining to Lake Okeechobee, the Caloosahatchee River Basin, the St. Lucie Estuary Basin, the Everglades and the Lower East Coast. These are in addition to the over 44,000 acres of stormwater treatment areas already being constructed pursuant to the Everglades Forever Act to treat water discharged from the Everglades Agricultural Area.

***Improve Water Deliveries to the Everglades.*** The volume, timing and quality of water delivered to the south Florida ecosystem will be greatly improved. The Comprehensive Plan will deliver an average of 26 percent more water into Northeast Shark River Slough compared to current conditions. This translates into nearly a half million acre-feet of additional water reaching the slough and is especially critical in the dry season. More natural refinements will be made to the rainfall-driven operational plan to enhance the timing of water sent to the Water Conservation Areas, Everglades National Park and the Holeey Land and Rotenberger Wildlife Management Areas.

***Remove Barriers to Sheetflow.*** More than 240 miles of project canals and internal levees within the Everglades will be removed to reestablish the natural sheetflow of water through the Everglades. Most of the Miami Canal in Water Conservation Area 3 will be removed, and 20 miles of the Tamiami Trail (U.S. Route 41) will be rebuilt with bridges and culverts, allowing water to flow more naturally into Everglades National Park, as it once did. In the Big Cypress National Preserve, a north-south levee will be removed to restore more natural overland water flow.

***Store Water in Existing Quarries.*** Two limestone quarries in northern Miami-Dade County will be converted to water storage reservoirs to supply Florida Bay, the Everglades, Biscayne Bay and Miami-Dade County residents with water. The 11,000-acre area will be ringed with a seepage barrier to ensure that stored water does not leak or adjacent groundwater does not seep into the area. A similar facility will be constructed in northern Palm Beach County.

***Reuse Wastewater.*** The Comprehensive Plan includes two advanced wastewater treatment plants in Miami-Dade County capable of making more than 220 million gallons a day of the county's treated wastewater clean enough to discharge into wetlands along Biscayne Bay and recharge the Biscayne Aquifer. This reuse of water will improve water supplies to south Miami-Dade County as well as reduce seepage from the Northeast Shark River Slough area of the Everglades. Given the high cost associated with using reuse to meet the ecological goals and objectives for Biscayne Bay, other potential sources of water to provide freshwater flows to the central and southern bay will be investigated before pursuing reuse.

***Improve Freshwater Flows to Florida Bay.*** Improved water deliveries to Shark River Slough, Taylor Slough and wetlands to the east of Everglades National Park will, in turn, provide improved deliveries of freshwater flows to Florida Bay.

***Monitor Pilot Projects.*** A number of technologies that are proposed in the Comprehensive Plan have uncertainties associated with them -- either in the technology itself, its application or in the scale of implementation. While none of the proposed technologies are untested, what is not known is whether actual performance will measure up to that anticipated in the Comprehensive Plan. The pilot projects, which include wastewater reuse, seepage management, Lake Belt technology and three aquifer storage and recovery projects are recommended to address uncertainties prior to full implementation of these components.

Overall, the Comprehensive Plan will capture and store much of the water that is now lost to the ocean and gulf. This will provide enough water in the future for the natural system as well as urban and agricultural users. It will continue to provide the same level of flood protection, if not more, as it does at present for south Florida. The Comprehensive Plan is a system-wide solution for ecosystem restoration, water supply and flood damage reduction. It is a necessary step toward a sustainable south Florida.

### **1.7.2 Projects Covered by this Master Program Management Plan**

The Comprehensive Plan includes 68 major components and six pilot projects. This Master Plan provides the general scope and guidance for the pilot projects and 56 components for which the SFWMD has agreed to be local sponsor. The remaining 12 components will be implemented through other programs, such as the Critical Restoration Projects authority, or will be implemented with an appropriate local sponsor under separate Design Agreements and Project Management Plans.

In developing the program implementation schedule, it was necessary to reorganize components into projects that would provide immediate and separable benefits. While many of the components already meet this definition of a project, other components were interdependent requiring that they be grouped for a more comprehensive and consistent analysis. For example, a flow distribution component that will enhance sheetflow into northwest and central Water Conservation Area 3A is dependent on improvements to the G-404 pump station to achieve the level of benefits identified in the Comprehensive Plan. These components were combined to create one project; Flow to Northwest and Central Water Conservation Area 3A. In addition, some components were grouped as a single project to provide the opportunity to generate a more efficient design of the components. For example, the components within North Palm Beach County were combined into the North Palm Beach County Project to address the interdependencies and tradeoffs between the different components and provide a more efficient design of the project.

Other components were separated into multiple projects in order to accelerate implementation of separable elements of a component. For instance, due to the need to conduct the Aquifer Storage and Recovery Pilot Project before constructing any full scale project, the Hillsboro Site 1 Impoundment and Aquifer Storage and Recovery component was separated into the Hillsboro Site 1 Impoundment Project (Part 1) and the Hillsboro Site 1 Aquifer Storage and Recovery Project (Part 2). Consequently, project benefits from accelerated implementation of the impoundment can begin to accrue earlier than if the impoundment portion were delayed until the pilot project was completed. Finally, some projects are divided into construction phases to permit more efficient implementation of the projects.

The resulting 31 projects and six pilot projects to be implemented under this Master Plan are listed in Table 1-1 and described in Appendix A. The component designation that was used throughout the planning and modeling of the Comprehensive Plan is included in parentheses, e.g. (A). Other Project Elements are identified as (OPE).

**PROJECTS COVERED BY THE MASTER PROGRAM MANAGEMENT PLAN**  
**Table 1-1**

PROJECT/SEPARABLE ELEMENTS			DESCRIPTION
Pilot Projects			
P1	Lake Okeechobee ASR Pilot Project		Demonstrate ASR technology
P2	Caloosahatchee River ASR Pilot Project		Demonstrate ASR technology
P3	Hillsboro Site 1 Impoundment and ASR Pilot Project		Demonstrate ASR technology
P4	Lake Belt In-Ground Reservoir Technology Pilot Project		Demonstrate seepage management technology in rock mined areas
P5	L-31N Seepage Management Pilot Project		Demonstrate seepage management technology
P6	Wastewater Reuse Technology Pilot Project		Demonstrate wastewater reuse technology
Kissimmee River and Lake Okeechobee Region			
1	Lake Okeechobee Watershed Project		This project includes 4 separable elements
	1a	North of Lake Okeechobee Storage Reservoir (A)	17,500-acre reservoir @ 11.5 feet (200,000 AF) and 2,500-acre STA @ 4 feet (10,000 AF) for water storage to shorten the duration and frequency of damaging high water levels
	1b	Taylor Creek/Nubbin Slough Storage and Treatment Area (W)	5,000-acre reservoir @ 10 feet (50,000 AF) and 5,000-acre STA @ 4 feet (20,000 AF) to provide estuary protection, water supply, water quality treatment and flood protection benefits
	1c	Lake Okeechobee Watershed Water Quality Treatment Facilities (OPE)	3,500-acre headwater restoration/ regional reservoir assisted STA
	1d	Lake Okeechobee Tributary Sediment Dredging (OPE)	Sediment dredging on 10 mile primary canals
2	Lake Istokpoga Regulation Schedule Project (OPE)		Plan to balance fish and wildlife benefits with long-term comprehensive management plan
3	Lake Okeechobee Aquifer Storage and Recovery Project (GG – Phased Construction)		200 ASR wells @ 5 mgd (1,000 mgd) phased over time and location for supplemental water during the dry season
Caloosahatchee River Region			
4	C-43 Basin Storage Reservoir Project (D – Part 1)		20,000-acre reservoir @ 8 feet (160,000 AF) for environmental benefits to Caloosahatchee Basin
5	C-43 Basin Aquifer Storage and Recovery Project (D – Part 2)		44 ASR wells @ 5 mgd (220 mgd) for environmental benefits to Caloosahatchee Basin
6	Caloosahatchee Backpumping with Stormwater Treatment Project (DDD)		5,000-acre STA @ 4 feet (20,000 AF) to supplement water from Caloosahatchee River into Lake Okeechobee
Upper East Coast			
7	Indian River Lagoon Project		This project includes separable elements
	7a	C-44 Basin Storage Reservoir (B)	10,000-acre reservoir @ 4 feet (40,000 AF) for environmental benefits to St. Lucie Estuary
	7b	C-23, C-24 Storage Reservoirs (UU – Part 1)	14,400 acres of reservoirs (115,200 AF) to provide environmental benefits to Indian River Lagoon
	7c	C-25, and North and South Fork Storage Reservoirs (UU – Part 2)	33,950 acres of reservoirs (234,400 AF) to provide environmental benefits to Indian River Lagoon
Everglades Agricultural Area			



	PROJECT/SEPARABLE ELEMENTS	DESCRIPTION
8	Everglades Agricultural Storage Reservoir Part 1 Project (G – Part 1)	Approximately 50,000-acre reservoir @ 6 feet (300,000 AF) to store EAA runoff and Lake Okeechobee releases
9	Everglades Agricultural Storage Reservoir Part 2 Project (G Part – 2)	10,000-acre reservoir @ 6 feet (60,000 AF) to store Lake Okeechobee releases
<b>Big Cypress Region</b>		
10	Big Cypress/L-28 Interceptor Modifications Project (CCC)	Levee degrade, canal fill and 1,900 acres of STA to alleviate over drainage in Big Cypress
<b>Water Conservation Areas and Everglades Region</b>		
11	Flow to Northwest and Central Water Conservation Area 3A Project (II and RR Phased Construction)	Increase capacity of G-404 and add spreader canal system to improve hydropattern in NW WCA 3A and increase amount of water available in west-central region of WCA 3A to reduce dry out periods
12	Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement Phase 1 Project (QQ Part 1 and SS Part 2 – Phased Construction)	Fill in Miami Canal, improve N. New River Canal for water supply deliveries to Miami-Dade County, remove eastern portion of L-29 and raise eastern portion of Tamiami Trail, modify L-67 a and c to achieve unconstrained or passive flow between WCA 3B and Northeast Shark River Slough
13	Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement Phase 2 Project (AA, QQ Part 2 – Phased Construction)	Remove remainder of L-29 and raise western portion of Tamiami Trail below WCA 3A, remove southern portion of L-28 and L-28 tieback and replace L-67 a and c with passive weirs to achieve unconstrained flow between WCA 3 and Everglades National Park
14	Loxahatchee National Wildlife Refuge Internal Canal Structures Project (KK)	Water Control Structures to improve timing and location of water depths in Refuge
15	Modify Holey Land Wildlife Management Area Operation Plan (DD)	Change in rules to improve timing and location of water depths in Holey Land Water Management Area
16	Modify Rotenberger Wildlife Management Area Operation Plan (EE)	Change in rules to improve timing and location of water depths in Rotenberger Water Management Area
<b>Lower East Coast Region</b>		
17	North Palm Beach County Project (Part 1)	This project includes a number of separable elements
	17a Pal Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration (OPE)	3,000-acre land acquisition for area connection between Pal Mar and Corbett and hydropattern restoration for SE Corbett
	17b C-51 and L-8 Basin Modifications and Reservoir (K Part 1 and GGG – Phased Construction)	1,200-acre reservoir @ 40 foot depth (48,000 AF), L-8 Basin canal improvements and STA (tbd) for environmental restoration and water supply for environmental and water supply goals in Lake Worth Lagoon and West Palm Beach Water Catchment Area
	17c Lake Worth Lagoon Restoration (OPE)	Sediment removal on C-51
	17d C-17 Backpumping and Treatment (X)	550-acre STA @ 4 feet (2,200 AF) to supplement water to West Palm Beach Water Catchment Area and Loxahatchee Slough
	17e C-51 Backpumping and Treatment (Y)	600-acre STA @ 4 feet (2,400 AF) to supplement water to West Palm Beach Water Catchment Area and Loxahatchee Slough
18	North Palm Beach County Project (Part 2)	This project includes two separable elements

PROJECT/SEPARABLE ELEMENTS			DESCRIPTION
	18a	C-51 Regional Ground Water Aquifer Storage and Recovery (LL)	34 ASR wells @ 5 mgd (170 mgd) for supplemental water to C-51 during the dry season
	18b	L-8 Basin ASR (K - Part 2)	10 ASR wells for environmental restoration and water supply for environmental and water supply goals in Lake Worth Lagoon and West Palm Beach Water Catchment Area
19	Water Preserve Areas A-List Project		This project includes numerous separable elements
	19a	Acme Basin B Discharge (OPE)	620-acre reservoir @ 8 feet (4,950 AF) and 310-acre STA @ 4 feet (1,240 AF) for treatment of water sent to Loxahatchee National Wildlife Refuge
	19b	Protect & Enhance Existing Wetland Systems along Loxahatchee National Wildlife Refuge including the Strazzulla Tract (OPE)	3,335 acres of wetland acquisition along LNWR
	19c	Hillsboro Site 1 Impoundment (M – Part 1)	2,460-acre reservoir @ 6 feet (14,760 AF) to supplement water deliveries to the Hillsboro Canal during the dry season
	19d	Western C-11 Diversion Impoundment and Canal and WCA 3A&B Levee Seepage Management (O, Q, SS Part 1 – Phased Construction)	1,600-acre impoundment @ 4 feet (6,400 AF) to clean water from western C-11 basin, 3,350 acre buffer, levee improvements, and diversion canal for water supply deliveries to Miami-Dade County to reduce seepage and improve hydropatterns within the WCA
	19e	C-9 Stormwater Treatment Area/Impoundment (R)	2,500-acre impoundment @ 4 feet (10,000 AF) for treatment of water in north lake belt storage area
	19f	Dade-Broward Levee/Pennsuco Wetlands (BB)	Levee and canal improvements to reduce seepage from Pennsuco Wetlands
	19g	C-4 Control Structures (T)	Water control structure to control seepage
	19h	Bird Drive Recharge Area (U)	2,900-acre shallow impoundment @ 4 feet (11,600) to recharge groundwater and reduce seepage from ENP
20	Palm Beach County Agriculture Reserve Reservoir Project (VV – Part 1)		1,660-acre reservoir @ 12 feet (19,920 AF) to supplement water deliveries to central and southern Palm Beach County
21	Palm Beach County Agriculture Reserve Aquifer Storage and Recovery Project (VV – Part 2)		15 ASR wells @ 5 mgd (75 mgd) to supplement water deliveries to central and southern Palm Beach County
22	Hillsboro Site 1 ASR Project (M – Part 2)		30 ASR wells @ 5 mgd (150 mgd) to supplement water deliveries to the Hillsboro Canal during the dry season
23	Diverting Water Conservation Areas to Central Lake Belt Storage to Downstream Natural Areas Project (YY, ZZ, and EEE – Phased Construction)		Water control structure to remove excess flows from WCA 2B and divert flows to WCA 3B
24	Broward County Secondary Canal System Project (CC)		Canal improvements for water supply
25	North Lake Belt Storage Area Project (XX – Phased Construction)		4,500-acre in-ground reservoir @ 20 foot depth (90,000 AF)
26	Central Lake Belt Storage Project (S – Phased Construction)		5,200-acre in-ground reservoir @ 36 foot depth (187,200 AF) to provide flows to Everglades National Park
27	Everglades National Park Seepage Management Project (V and FF – Phased Construction)		Relocation of L-31 N and Modified Water Deliveries Structure S-356 to reduce seepage losses from and enhance flows into Everglades National Park

	PROJECT/SEPARABLE ELEMENTS	DESCRIPTION
28	Biscayne Bay Coastal Wetlands Project (FFF and OPE)	Sheetflow distribution to Biscayne Bay
29	C-111N Spreader Canal Project (WW)	Canal under US 1, Card Sound Rd. to improve hydroperiod in Model Lands
<b>Southwest Florida Region</b>		
30	Southern Golden Gate Estates Restoration Project (OPE)	Spreader channel, canal plugs, pump station and road removal
<b>Florida Bay and Keys Region</b>		
31	Florida Keys Tidal Restoration Project (OPE)	Culvert installation under US 1 to improve circulation in Florida Bay

There are several operational components that will be implemented as integral features of the projects listed in Table 1-1. While these components do not require additional congressional action to implement, they will be included in the studies necessary to further the project to completion. Also, other operational changes will be implemented as part of other existing state programs. These projects are critical to the success of the Comprehensive Plan and implementation of these projects will be funded and monitored through the RECOVER process.

## OPERATIONAL COMPONENTS COVERED BY THE MASTER PROGRAM MANAGEMENT PLAN

**Table 1-2**

#	Project	Explanation	Projects
32	Lake Okeechobee Regulation Schedule (F)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• Lake Okeechobee Watershed Project</li> <li>• Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>• C-43 Basin Storage Reservoir and ASR Projects</li> <li>• Caloosahatchee Backpumping with Stormwater Treatment Project</li> <li>• Indian River Lagoon Project</li> <li>• Everglades Agricultural Storage Reservoir Projects</li> <li>• North Palm Beach County Projects</li> <li>• Water Preserve Areas A-List Project</li> <li>• Palm Beach County Agriculture Reserve Reservoir Projects</li> <li>• Hillsboro Site 1 Impoundment and ASR Project</li> <li>• Diverting Water Conservation Areas to Central Lake Belt Storage to Downstream Natural Areas Project</li> <li>• Broward County Secondary Canal System Project</li> <li>• North Lake Belt Storage Area Project</li> </ul>

#	Project	Explanation	Projects
			<ul style="list-style-type: none"> <li>Central Lake Belt Storage Project</li> </ul>
33	Environmental Water Supply Deliveries to the Caloosahatchee Estuary (E)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>Lake Okeechobee Watershed Project</li> <li>Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>C-43 Basin Storage Reservoir and ASR Projects</li> <li>Caloosahatchee Backpumping with Stormwater Treatment Project</li> <li>Everglades Agricultural Storage Reservoir Projects</li> </ul>
34	Environmental Water Supply Deliveries to the St. Lucie Estuary (C)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>Lake Okeechobee Watershed Project</li> <li>Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>Indian River Lagoon Project</li> <li>Everglades Agricultural Storage Reservoir Projects</li> </ul>
35	Everglades Rain Driven Operations (H)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>Lake Okeechobee Watershed Project</li> <li>Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>Caloosahatchee Backpumping with Stormwater Treatment Project</li> <li>Everglades Agricultural Storage Reservoir Projects</li> <li>Big Cypress/L-28 Interceptor Modifications Project</li> <li>Flow to Northwest and Central Water Conservation Area 3A Project</li> <li>Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement Projects</li> <li>Loxahatchee National Wildlife Refuge Internal Canal Structures Project</li> <li>Water Preserve Areas Projects</li> <li>Diverting Water Conservation Areas to Central Lake Belt Storage to Downstream Natural Areas Project</li> <li>North Lake Belt Storage Area Project</li> <li>Central Lake Belt Storage Project</li> <li>Everglades National Park Seepage Management Project</li> </ul>
36	Change Coastal Wellfield Operations (L)	Implement under existing state process	RECOVER will monitor progress
37	Lower East Coast Utility Water Conservation (AAA)	Implement under existing state process	RECOVER will monitor progress

#	Project	Explanation	Projects
38	Operational Modifications to Southern Portion of L-31N and C-111(OO)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• C-111 Project (ongoing)</li> <li>• C-111N Spreader Canal Project</li> <li>• Everglades National Park Seepage Management Project</li> </ul>

### 1.7.3 Ongoing Projects and Programs

Development of south Florida's water management system has been continuous since the original Central and Southern Florida Project's authorization. Numerous efforts are currently under way to modify the project. Some major ongoing efforts within the program area that are sufficiently developed and could impact or be impacted by the Comprehensive Plan include: Critical Restoration Projects, C-111 Project, C-51 Project, Everglades Construction Project, Kissimmee River Restoration, Modified Water Deliveries to Everglades National Park, Lower East Coast Regional Water Supply Plan and, Minimum Flows and Levels. These ongoing efforts could have a direct impact on the success of the Comprehensive Plan. Therefore, integration and coordination of these efforts with implementation of the Comprehensive Plan is critical. This integration will occur through the RECOVER process identified in Section 3.2 of this document.

## 1.8 Protocol for Updating the Master Program Management Plan

The Master Plan is not intended to be all-inclusive nor to anticipate or include all possible changes to the Comprehensive Plan during its continuing development. Rather, it is a dynamic document that will require revision and updating as the program progresses through its completion. As described previously, this Master Plan is written in two volumes. Volume I is an overview of the processes necessary to implement the program and individual projects and includes specific functions and activities associated with managing the program with a system-wide perspective. Volume I will be updated, as necessary, to reflect improvements and refinements in processes and protocols as the program progresses through implementation. Volume II includes an Annual Report and Work Plan that will summarize all Comprehensive Plan activities under way. The Volume II appendices will be updated twice each year and the entire Volume II Annual Report and Work Plan will be updated once each year (See Section 6.0). Master Plan updates will be approved by the Corps and SFWMD in accordance with Section 5.1 of this document.

## **2.0 Program Management**

Because of the large number of projects included in the Comprehensive Plan, as well as many related ongoing projects that impact the system-wide restoration effort, an intense and innovative management, coordination and communication effort will be required throughout implementation of the plan. The program management strategies to be used during the implementation phase build upon the interagency partnership, implementation guidelines and successful strategies developed during the Restudy's feasibility planning phase. This section summarizes the program management structure as well as the processes to be used for completing program-level activities such as program controls, contract management and real estate protocols.

### **2.1 Program Management and Coordination**

The Corps and the SFWMD will establish Program Managers to provide programmatic oversight for work completed under the Design Agreement. The Corps' Program Manager will report to the Deputy District Engineer for Programs and Project Management in the Jacksonville District and the SFWMD's Program Manager will report to the Director for the Water Supply Division. The Corps and the SFWMD will establish a Design Coordination Team to provide program management and oversight for the design of all Comprehensive Plan projects for which the SFWMD is the local sponsor. In addition, a Project Delivery Team will be established to implement each project. An Independent Technical Review Team also will be assembled for each project to review planning, engineering and design products. This section describes the membership composition, scope and responsibilities of the Design Coordination Team, Project Delivery Teams and Independent Technical Review Teams.

#### **2.1.1 Design Coordination Team**

A Design Coordination Team comprised of Corps, SFWMD and Florida Department of Environmental Protection staff will meet regularly throughout the period of design for the Comprehensive Plan to provide for consistent and effective communication, coordination and issue resolution on projects included in the Design Agreement. The Design Coordination Team will provide technical and managerial oversight on issues related to design including:

- Design schedules and budgets
- Design plans and work products including Project Management Plans, Project Implementation Reports, Pilot Project Design Reports and Design Documentation Reports
- Construction plans and specifications
- Updates of the Master Program Management Plan
- Real property and relocation requirements
- Contract scopes of work, modifications and costs
- Program and project cost projections
- Anticipated requirements for performance of operation, maintenance, repair, replacement and rehabilitation of a project
- Restoration Coordination and Verification (RECOVER) efforts

- Development of program-level procurement strategies

The Design Coordination Team also will review design cost estimates and actual expenditures to ensure that design work is proceeding cost effectively and within budget.

As needed, the Design Coordination Team also will consider Comprehensive Plan projects being sponsored by other agencies and other Corps-sponsored ecosystem restoration projects in south Florida (e.g., Kissimmee River Restoration, C-111 Project, Modified Water Deliveries Project, etc.) that may impact the design of projects covered by the Design Agreement. The Design Coordination Team will identify and attempt to resolve technical issues that have potential to impact major milestones or budgets, or have system-wide restoration impacts. When necessary, the team will elevate issues and/or recommendations to the SFWMD's senior management and the Jacksonville District's Project Review Board.

The Design Coordination Team will be comprised of managers (e.g., Corps Assistant Division Chiefs and Branch Chiefs and SFWMD Division and Department Directors) and senior level staff from the Corps and the SFWMD as well as a representative from the Florida Department of Environmental Protection. The team will include representatives from various disciplines within the Corps and SFWMD, including but not limited to, project management and program controls; design and construction management; real estate; research and monitoring; operations and maintenance; environmental compliance; regulation and permitting; and others. The Corps and the SFWMD program managers for the Comprehensive Plan will co-chair the Design Coordination Team and will periodically report to the Jacksonville District's Project Review Board and the SFWMD's senior management.

The Design Coordination Team will review budgets and schedules for each project and will conduct a formal review of each project on a semiannual basis. On a monthly basis, project managers will provide the Design Coordination Team with an overview of the technical and funding status of their projects as well as a summary of any technical, schedule or budget issues, and actions being taken to resolve these issues. Slippage of major milestones and significant changes in budgets will be elevated to the Jacksonville District's Project Review Board and the SFWMD's Executive Director for approval. The responsibility for coordinating any approved changes in scope, schedule or budget lies completely with the project managers.

### **2.1.2 Project Delivery Teams**

Implementation of the Comprehensive Plan projects being co-sponsored by the SFWMD will be the responsibility of the Corps and the SFWMD as the implementing agencies. The Corps and the SFWMD will assign individual project managers who will be responsible for the successful implementation of these projects on schedule and on budget, and will ensure that projects are designed and contracted consistent with the Design Agreement, this Master Plan and Project Management Plans. The Project Delivery Teams will develop the products necessary to deliver these projects (e.g., Project Implementation Reports, plans and specifications, etc.). Project Delivery Teams will be formed from the resources of the implementing agencies, which would include in-house staff, or in some cases architect-engineer contract services. The project managers, working with technical staff from both agencies, will establish the Project Delivery

Teams or determine the need to outsource efforts during the early stages of project implementation.

Project Delivery Teams will be interdisciplinary in composition. Additionally, and by joint invitation, the Corps and the SFWMD will request that Federal, state, local and tribal governments participate in the development of the projects. In general, agency participation in project development will be the financial responsibility of the participating agencies. An exception to this is the U.S. Fish and Wildlife Service's preparation of Coordination Act Reports, for which the Corps provides funding to the service. Utilizing the skills of these specialists from other agencies will provide additional expertise to product development, facilitate the flow of information among agencies, and help achieve concurrence and ownership by the key public agency stakeholders throughout project implementation. Should issues arise within the Project Delivery Teams that are unable to be resolved by the team, the project managers will elevate the issues to the Design Coordination Team.

Because of the importance that permitting will play in the timely implementation of projects, the project managers, as appropriate, will invite representatives from the Corps' and SFWMD's regulatory/permitting divisions, a representative from the Florida Department of Environmental Protection and local regulatory agencies to participate in project development as well. The Project Delivery Teams will also coordinate with the RECOVER teams at pertinent periods throughout the project delivery process to ensure compatibility between project and system-wide objectives.

### **2.1.3 Independent Technical Review Teams**

Throughout the life of each project, quality assurance will be maintained through periodic independent technical reviews. During development of the Project Management Plan for each project, an Independent Technical Review Team will be established to conduct reviews, as needed, to ensure that design products are consistent with established criteria, guidance, procedures and policy. The members of the team will be completely independent of the Project Delivery Team and the project being reviewed, and should be knowledgeable of design criteria established for the Comprehensive Plan. The Independent Technical Review Teams may be composed of Corps, SFWMD and contract personnel or any combination of the three. Independent technical review will be a continuous process with reviews coordinated by the project managers to minimize lost design efforts. All planned reviews will be integrated into project scheduling and closely tracked to ensure their timely completion.

The Independent Technical Review Team will document its actions and recommendations and report to the Project Delivery Team at critical points during the project design phase.

## **2.2 Program Controls**

To ensure successful implementation of the Comprehensive Plan on schedule and within budget, a set of program controls will be developed and implemented. This section describes the program control activities planned for implementation by the Corps and SFWMD. The program



control activities are grouped under three general headings: 1) information management, 2) financial management and 3) schedule management.

### **2.2.1 Information Management**

A set of program controls will be established to provide project managers with processes and tools to manage documents, data and information that are critical to implementation of the Comprehensive Plan. Effective information management is a critical component of program controls for a program the scope and magnitude of the Comprehensive Plan.

#### **2.2.1.1 Shared Data and Information Network**

A separate network will be established to facilitate electronic document storage and retrieval as well as information management and collaboration for the Comprehensive Plan implementation. This shared data and information network will be equally accessible to both the SFWMD and the Corps. It will consist of a web site and servers that will allow for sharing of draft and final documents, schedules, financial, scientific and geospatial data, and other program-related information between the Corps, SFWMD and other authorized users. The infrastructure and software will be designed to eliminate the potential for security and firewall breaches that could threaten the integrity of the system and the information it contains. The web site also will be used to post information and data for review by other agencies, stakeholder groups and the public.

#### **2.2.1.2 Geospatial Data Management**

A data management plan will be developed to ensure that all geospatial data needed for the Comprehensive Plan implementation can be easily accessed, retrieved and used by all authorized users. Geospatial data includes but is not limited to surveys, maps, aerial photography, aerial imagery, and biological, ecological, and hydrological modeling coverages. The Corps and SFWMD will collect, store, disseminate and use geospatial data from multiple sources. To effectively manage this data, the Corps and SFWMD will establish standards and procedures to facilitate electronic storage, retrieval and transfer of data. The standards and procedures will address such topics as geospatial metadata, data projections, horizontal/vertical datums, file formats, compression techniques, file coding and file naming conventions for all geospatial data to be stored on the shared data and information network.

#### **2.2.1.3 Real Estate Data Management System**

Real estate acquisition is a key element in the implementation of the Comprehensive Plan and represents a significant portion of the workload and costs for the program (i.e., approximately 25 percent of total cost). Tracking real estate acquisition is also critical to project implementation. The SFWMD, in collaboration with the Corps, will upgrade the real estate data management system used for tracking activities associated with land acquisition for the Comprehensive Plan. Process improvements and database modifications will be made to streamline information sharing; improve data input efficiency and data reliability; expand querying, tracking, reporting and mapping capabilities; and improve accessibility by users within the SFWMD and the Corps. By linking the ORACLE database with Geographic Information Systems, the new system will allow more efficient production of project maps showing the status of real estate acquisition

(e.g., maps showing all lands in project with legends showing lands purchased, lands under contract, lands appraised, etc.). A common web-enabled interface will allow Corps and SFWMD staff easy access to the database.

While the majority of lands purchased by the SFWMD in the next 10 to 15 years will be for implementation of the Comprehensive Plan, this system also will enhance real estate tracking for other SFWMD land acquisition projects. Consequently, only a portion of the development costs will be allocated to the Corps-SFWMD Design Agreement.

#### **2.2.1.4 Document Management and Control**

The Corps and the SFWMD will work together to develop and implement a process and protocol for tracking and documenting decisions that impact the design, design process or schedules for the Comprehensive Plan. A document management and control system will be developed and implemented for collaboration, storage and retrieval of design products, records and documents, as well as information pertaining to design costs and expenses incurred during implementation of the Comprehensive Plan. The Corps and SFWMD will develop and maintain a compatible document management and control system so that all information is readily available to both organizations with electronic posting to the shared data information network.

All Corps and SFWMD project managers will be expected to become familiar with and use the document management and control system. It is critical that all electronic and hardcopy project documents generated during the implementation of their project be preserved for the record and are accessible to others.

### **2.2.2 Financial Management**

Proper financial management is key to successfully implementing the Comprehensive Plan. The task of managing a program with the scope and magnitude of the Comprehensive Plan will require strict adherence to protocols identified within this section. A project manager's success in bringing a project to a successful conclusion will directly rest on how well the protocols outlined below are understood and followed.

#### **2.2.2.1 Cost Estimating and Forecasting**

The Corps and the SFWMD will develop and implement standard protocols for collection, dissemination and reporting of all estimated direct project costs and overhead costs. A key objective of this effort will be for both agencies to use a common estimating and cost component terminology and to rely on common indices for cost escalation. This will ensure uniformity in cost estimates and enable each agency to capture the other's data in a usable format that can then be applied to any tracking and forecasting methodology. It will also ensure consistency of program costs as reported by the two agencies.

Program and project managers will be directly responsible for the collection, analysis and dissemination of all program-level and project-level cost estimates. Using the protocol referenced above will ensure that cost estimates are uniform and that all forecasted costs reflect the most current and accurate data available.

### **2.2.2.2 Budget Development Process**

The Corps and the SFWMD will work together to establish a timely process for developing yearly project cost estimates for implementing the Design Agreement in a manner that accommodates the budget development processes of both agencies. In particular, the budget development process will include the SFWMD's statutory obligation to seek approval from the Florida Department of Environmental Protection in accordance with the criteria contained in Sections 373.1501(5)(a-e), of the Florida Statutes, for project components requiring state funding. The budget development process will also recognize that requests for state appropriations by the SFWMD for project components are to be submitted to the Florida Department of Environmental Protection and included in the department's annual budget requests to the Governor.

Appendices A and B to Volume II of the Master Plan will serve as the vehicle for updating design cost estimates, which will then be used by the Corps and SFWMD to develop their annual funding requests. Draft updates to the Volume II appendices will be completed by March 1<sup>st</sup> of each year and final updates will be completed by April 15<sup>th</sup>.

Project managers will ensure that cost estimates included in the funding requests for their projects reflect the most current information available. Development of annual budget forecasts, fact sheets and work-in-kind credit reports for individual projects are the direct responsibility of the assigned project manager.

### **2.2.2.3 Financial Reporting Requirements**

The Corps and SFWMD will furnish one another with quarterly financial reports that summarize all expenditures, budget projections and comparisons between budgeted and actual expenditures for each project. The Corps and SFWMD will develop and utilize standardized financial reports with the following requirements:

- The reports will provide actual expenditure data, organized by project, and further organized by separable elements, where required. Within each project or separable element, expenditures will be broken out by cost categories as defined in each agency's cost accounting system. The reports will present the expenditure totals in quarterly, yearly and inception-to-date formats.
- The reports will reflect the most current estimates of total costs to be budgeted, on a yearly basis, organized by project, and further organized by separable elements where required. Within each project or separable element, cost projections will be sorted by cost category. Reports will reflect any changes in cost projections as well as a quantification and explanation of variances from estimates reflected in previous reports. The Corps and the SFWMD will work together to develop standard protocols for tracking and documenting changes in cost estimates.
- The reports will reflect comparisons of actual expenditures to projected costs budgeted for

each cost category within a project. The reports shall quantify variances between actual costs and projected costs and be accompanied by an explanation of these variances.

The Corps and the SFWMD will make the above-mentioned financial reports available no later than the 30<sup>th</sup> day following the end of each quarterly reporting period. These reports and all source data will be maintained in accordance with document control protocols (See Section 2.2.1.4) for future reference or audit.

Project managers will ensure that they are familiar with the financial reports listed above. Use of these reports on a quarterly basis will enhance the fiscal integrity of the Comprehensive Plan. Using these tools, project managers will stay informed on their project's financial status, manage their work effort within established budget targets and quickly identify problem areas within their projects.

#### **2.2.2.4 Corps Request of In-kind Credits for the SFWMD**

In accordance with Section 208(d) of the Water Resources Development Act of 1999 and the Design Agreement, all design work for which the SFWMD will receive in-kind credit will be performed at the request of the Secretary of the Army. The Secretary of the Army has delegated authority to the Jacksonville District Engineer to request the SFWMD to perform in-kind work to further the design of the Comprehensive Plan. All in-kind performed by the SFWMD will be covered by a written request from the Jacksonville District Engineer. Such written requests can be handled in one of three ways:

- A letter of transmittal for a Project Management Plan for one of the individual projects. This letter will request the SFWMD to perform the in-kind work described in a Project Management Plan that has been approved by the Corps and SFWMD in accordance with Section 5.1 of this Master Plan.
- A letter of transmittal for a management plan for a program-level activity. This letter will request the SFWMD to perform the in-kind work described in a management plan that has been approved by the Corps and SFWMD in accordance with Section 5.1 of this Master Plan.
- A separate letter describing the in-kind work to be performed by the SFWMD.

The SFWMD will accept the request for performing in-kind work through approval of a Project Management Plan, approval of a management plan for a program-level activity or through a letter response to the Corps.

The SFWMD will submit a report for in-kind credit to the Corps on a quarterly basis. The Corps will review products submitted as in-kind credit and provide the SFWMD with a letter indicating approval of in-kind work completed. The SFWMD may request that the Corps perform an interim accounting review to reconcile in-kind credit upon completion of design work for a project. Audits by the Corps will occur, as needed, in accordance with the Design Agreement. Any in-kind discrepancies between the Corps and SFWMD will be resolved prior to a final audit at project closeout.

### **2.2.2.5 Audits**

The Corps and SFWMD may request audits of either party's financial activities to ensure each party is following generally accepted accounting principles. Audits will be conducted by any mutually agreed upon entity, so long as the audits are conducted in accordance with generally accepted government auditing standards issued by the Comptroller General of the United States. The audits will ensure that each party maintains adequate internal controls over financial data to achieve effective and efficient operations, reliable financial reporting and compliance with applicable state and Federal laws and regulations. Costs of audits will be cost-shared in accordance with the provisions of the Design Agreement. Audits will be completed on a regular basis or as soon as a segment of work of reasonable quantity has been completed.

Project managers play a key role in facilitating audits of their projects by ensuring that the resource needs of the audit team are met and providing auditors with access to all necessary documentation needed to successfully carry out their audit.

### **2.2.3 Schedule Management**

A set of program controls will be put in place to provide project managers with processes and tools to control costs, schedules and resources during the implementation of the Comprehensive Plan. The Corps and SFWMD will develop and maintain a common program scheduling and tracking system for planning, scheduling, monitoring and controlling all projects within the program.

This program scheduling and tracking system will be configured to use one common repository of data and provide access for data entry and retrieval by both Corps and SFWMD authorized staff. The system will be capable of interfacing with existing and future administrative, accounting, reporting and scheduling systems used by the Corps and the SFWMD. Roll up program and project schedules generated by this system will be made available on the web site of the shared data and information network to keep the public informed of the status of projects.

## **2.3 Contract Management**

### **2.3.1 Procedures for Contracting Actions**

All project elements designated for performance by contract will be processed in accordance with the procuring agency's (Corps or SFWMD) standard acquisition policies and in accordance with all applicable state and federal laws, regulations and executive orders. The procuring agency will have exclusive authority over contractual actions, however, the Corps and the SFWMD agree to provide each other with the opportunity to review and comment on solicitations for all contracts, including relevant draft scopes of work, prior to issuance of solicitations. Whenever practicable, the Corps and the SFWMD will offer each other the opportunity to review and comment on contract modifications, including change orders, prior to issuing the contractor a Notice to Proceed. If it is necessary to conduct non-procuring agency

reviews and solicitation advertisements concurrently, review comments will be submitted to the procuring agency prior to the date established for receipt of bids or proposals. The procuring agency's project manager will work with the contracting officer and appropriate staff from the Corps and SFWMD to develop a Source Selection Plan and a Technical Evaluation Team for each project. The Corps and the SFWMD agree to offer each other the opportunity, if desired, to participate in the development of a Source Selection Plan and to serve as a voting member on the Technical Evaluation Team for all competitive acquisitions. All procurement information will be managed to maintain the integrity of the procurement process as required by the procuring agency.

### **2.3.2 Procedure for Identification of Prospective Contractors**

The Corps and the SFWMD agree to share available information that will help expand the list of qualified firms for participation in procurement opportunities. The parties agree to develop and conduct outreach activities designed to keep prospective contractors and vendors informed of procurement opportunities and to promote to the maximum extent practicable participation by small, disadvantaged and women-owned businesses. These activities will be conducted in a manner consistent with applicable state and Federal laws, regulations, executive orders and policies.

## **2.4 Real Estate Program Requirements**

The Corps and SFWMD will identify real estate members for each Project Delivery Team. These real estate staff will work closely together to ensure that real estate needs and estimated costs are thoroughly described in the Project Implementation Reports, considering past and future land acquisition for each project. The real estate team members will also collaborate to ensure that all scheduled real estate milestones are being met during the Project Implementation Report preparation, land acquisition and certification, crediting, and operations and maintenance phases of the project.

### **2.4.1 Real Estate Plan**

A Real Estate Plan developed by the Corps and SFWMD will be included as an appendix to each Project Implementation Report. The Real Estate Plan will be developed consistent with guidance provided by Corps Engineering Regulation 405-1-12, Chapter 12. The Corps and SFWMD will collaboratively develop a gross appraisal in accordance with Chapter 4 of Engineering Regulation 405-1-12. This gross appraisal will be prepared, reviewed and approved according to Corps delegated authority. Real estate baseline cost estimates will not be released in final form until gross appraisal approval is received. The gross appraisal and the Real Estate Plan prepared in support of the Project Implementation Report will address all lands identified as needed for the project. Additional land requirements may be identified in future design documents. The SFWMD is responsible for acquiring and providing all lands identified in the Real Estate Plan required to support construction and operation of the projects in accordance with the Project Cooperation Agreement.

## **2.4.2 Previously Acquired Lands**

The SFWMD has already acquired some lands that will be utilized for components of the Comprehensive Plan projects. The lands were acquired utilizing a variety of funding sources (e.g., SFWMD funds, State of Florida-Save Our Rivers funds, State of Florida-Conservation and Recreation Lands funds, State of Florida-Preservation 2000 funds, and State of Florida-Florida Forever funds). Some of these lands were purchased with grant funds provided by the Department of Interior pursuant to Section 390, Federal Agriculture Improvement and Reform Act of 1996 (Farm Bill) and the Land and Water Conservation Fund. Many of the SFWMD's land acquisition programs are continuing programs, therefore, additional lands will be acquired prior to preparation of the Project Implementation Reports.

For lands already acquired, the Real Estate Plan will utilize actual land costs to the extent available in preparation of the gross appraisal. The gross appraisal will contain actual costs for the land acquisition based on information in the SFWMD's parcel files unless for some reason those costs are not reflective of project land costs due to age or other good reason. Utilization of the cost data for the gross appraisal purposes is not binding for final value credit.

## **2.4.3 Interim Land Use**

The interim land use, which is the use made of the land acquired for a project from the time the land is acquired until the land is certified for construction, should, at the discretion of the SFWMD, be managed to allow maximum benefits for the project. Any decisions on land use will be made with a goal to have minimum impacts on project schedules. The Real Estate Plan will address allowable interim land uses.

## **2.4.4 Real Estate Standard Operating Procedure**

By March 1 of 2001, real estate staff from the Corps and SFWMD will prepare a Standard Operating Procedure (SOP) that describes processes and procedures to be used for all phases of real estate acquisition from review and approval of land acquisitions at the time SFWMD is negotiating with the land owner, through processing credit requests for the value and incidental costs associated with the land acquisition. During development of this Standard Operating Procedure, an attempt will be made to streamline each step in the acquisition and review process to minimize unnecessary work, avoid schedule delays and avoid duplication of effort. The Standard Operating Procedure will be coordinated for approval with all other organizational elements involved from both the Corps and SFWMD before it is finalized.

### **3.0 Programmatic Activities**

There are a number of programmatic activities that will be conducted under the Design Agreement over the entire design period. Programmatic activities are activities and tasks that are not linked to a specific project, but involve or affect more than one project or the entire restoration program. These activities include RECOVER, public outreach, socioeconomic and environmental justice studies, program management and technical coordination and other program level activities. Detailed management plans will be developed for these activities in order to coordinate and manage the program-level tasks. The management plans will outline what tasks are to be accomplished, when they will be accomplished, and which agency will be responsible for them. The Annual Report and Work Plan will outline the programmatic tasks to be accomplished each fiscal year. This section describes system-wide or programmatic activities that will be conducted under the Design Agreement over the entire design period. Appendix F describes the tasks to be performed under these programmatic activities.

### **3.1 Management Plans for Program-Level Activities**

Program-level activities are those which are system-wide in nature and span multiple projects, such as program management and technical coordination, Restoration Coordination and Verification (RECOVER), public outreach, socioeconomic and environmental justice and program controls. Management plans will be developed for each of these activities to establish the scope, schedule, costs, products and funding requirements necessary to carry out the activities and to produce the various products that comprise the program-level portion of the Comprehensive Plan. These management plans are intended to provide a common understanding between the Corps and the SFWMD on the scope and level of effort required and to provide a basis for managing and monitoring the execution of these activities. Generally, the management plans will define the major products, sub-products and, where appropriate, the activities associated with these work efforts. The plans will also identify who is responsible for completing the products that are necessary to support the execution of the program.

The management plans will reflect the Corps and SFWMD strategy for providing support to the implementation of individual projects, management of the system-wide activities, and other efforts that are not directly linked to project-level activities. This section provides some of the guiding principles that will be used for the development and implementation of the management plans for program-level activities. This guidance is intended to be general in nature, as it is realized that the different program-level activities will have their own unique requirements.

- Each program-level activity will be managed in accordance with a management plan, to be jointly developed by the Corps and the SFWMD. In the case where other agency representatives are part of the program-level activity team, these representatives will be included in the development of a plan.
- The management plans will identify the efforts to be performed by the Corps and SFWMD, and where possible, any commitments from other Federal, state, local, and tribal government agencies. They will also identify work to be performed by architect-engineer and/or other



contractors. Work to be performed relating to program-level activities will be carried out in accordance with the management plans.

- Each management plan will be developed and maintained at a level of detail commensurate with the complexity of the effort. The scope of each plan will be defined in sufficient detail to allow the Corps and SFWMD to establish parameters for the planning and execution of required activities.
- The management plans will be living documents, to be updated as new information becomes available. Adjustments to schedules and/or costs based on changes in the individual program-level activity scope will be reflected in future updates/revisions, as appropriate, and will have written documentation supporting the changes. Substantive changes to the management plans will require formal approval by the Corps and SFWMD.
- The management plans will include a schedule that is developed utilizing a Work Breakdown methodology. The schedule will provide the ability to exercise the appropriate level of management of the effort.
- The schedule will be developed at the level commensurate with the level of complexity of the effort, utilizing a network analysis system for the management and analysis of the activity. The network analysis system will provide the capability to roll-up individual phases and products into an overall schedule, and will depict the major milestones.
- The program-level cost estimates, both baseline and current, will be developed and will include contingencies with a documented level of uncertainty.
- The management plans will provide budgetary and scheduling information for the efforts.
- Unless otherwise stated, where a management plan contains work to be performed by the SFWMD, the effort shall be considered work-in-kind services (see Section 2.2.2.4). The management plans will define the products and services to be provided for the subject program-level activity. The costs of providing these products and services by the SFWMD will be based on the cost estimates contained in the plans with acceptance provided through the Corps' and SFWMD's approval of the management plan.
- Cost estimates for program-level activities will be developed using a common code of accounts.

### **3.1.1 Development of Management Plans for Program-Level Activities**

General guidance for the management plans has been provided above. Each management plan will contain a main body of text with supporting appendices. An outline for the main body and supporting appendices for individual project management plans has been proposed in Appendix B of this Master Plan. Project managers for program-level activities will use Appendix B as a model, to the extent that it is applicable to the program activity.

Similar to project management plans, management plans for program-level activities will utilize a network analysis system that incorporates product-level schedules, costs and resource data developed using a standard methodology. This information will provide program-level activity managers and others the ability to monitor and analyze schedules, costs, and resource performance, as well as support program reporting requirements.

Management plans for program-level activities, when combined with the individual project management plans, will provide Program Managers, Corps' staff chiefs, and SFWMD managers the ability to develop total program summary information for reporting and analysis.

### **3.1.2 Approval of Program-Level Management Plans**

After the appropriate review of a management plan for a program-level activity, the SFWMD project manager with the concurrence of the SFWMD Program Manager will submit four original copies of the management plan to the SFWMD Executive Director for approval and signature. Upon the documents being signed, the SFWMD project manager will prepare a letter of transmittal for all four signed originals sending them to the Corps Jacksonville District. The Corps project manager, with concurrence of the Corps Program Manager, will submit the four signed original management plans to the Project Review Board for Corps approval and signature by the Deputy District Engineer for Programs and Project Management. The Corps project manager will then prepare a letter of transmittal for the District Engineer's signature requesting the SFWMD to perform the work-in-kind services described in the management plan. This letter of transmittal and two original signed management plans will be delivered to the SFWMD.

## **3.2 Restoration Coordination and Verification (RECOVER)**

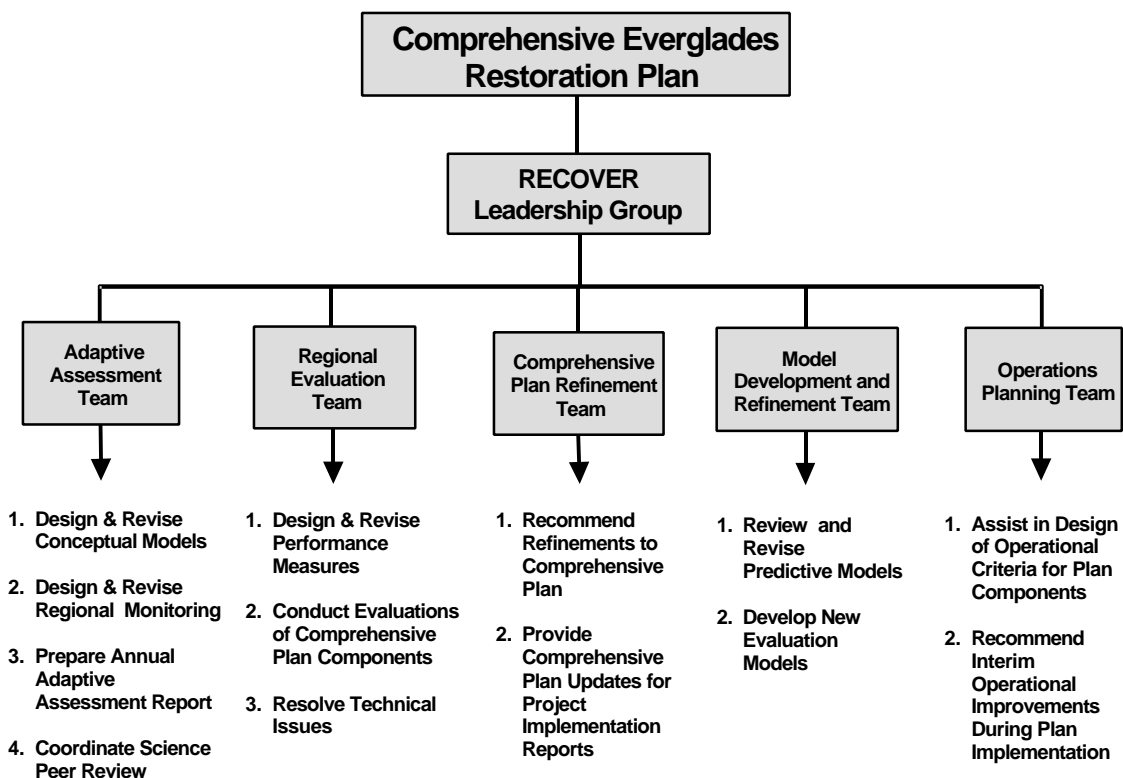
The role of Restoration Coordination and Verification (RECOVER) is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of the Comprehensive Everglades Restoration Plan. RECOVER links science and the tools of science to a set of system-wide planning, evaluation and assessment tasks. These links provide RECOVER with the scientific basis for meeting its overall objectives of evaluating and assessing Comprehensive Plan performance, refining and improving the plan during the implementation period, and ensuring that a system-wide perspective is maintained throughout the restoration program.

In order to establish and maintain an effective link between science and the Comprehensive Everglades Restoration Plan, the Central and Southern Florida Project Restudy Team created a process known as the Applied Science Strategy. The RECOVER team is responsible for the coordination and application of the components of the Applied Science Strategy during the implementation of the Comprehensive Everglades Restoration Plan. The major components of the science strategy are conceptual ecological models, performance measures and restoration targets, a system-wide monitoring and research program, and an adaptive assessment protocol. Elaboration of the Applied Science Strategy and the Adaptive Assessment protocol are provided in the RECOVER section of Appendix F of the Master Program Management Plan.

The overall objectives of RECOVER are to 1) evaluate and assess Comprehensive Plan performance; 2) recommend refinements and improvements in the design and operational criteria of the plan during the implementation period; 3) review the affects that other restoration projects may have on the performance of the Comprehensive Plan; and 4) ensure that a system-wide perspective is maintained throughout the restoration process. All RECOVER activities in support of these objectives will be documented in written reports. Recommendations for refinements and improvements to the Comprehensive Plan or requests for assistance in resolving any conflicting issues will be submitted to the Design Coordination Team for action.

### 3.2.1 RECOVER Teams

In order to meet these objectives, RECOVER has been organized into five interagency, interdisciplinary task teams and an overall coordinating or leadership group. The RECOVER teams are described below. Figure 3-1 depicts the RECOVER teams and their major responsibilities. Lead responsibility for the overall management of the RECOVER process will be performed by two co-chairs, one each from the SFWMD and the Corps.



**Figure 3-1  
RECOVER TEAMS**

### **3.2.1.1. RECOVER Leadership Group**

The RECOVER Leadership Group will be responsible for coordinating and integrating the activities of the other five RECOVER teams and ensuring that the overall focus and direction of the implementation process remains consistent with the goals of system-wide restoration. Specifically, the leadership group will:

- Set overall priorities for RECOVER
- Make recommendations pertaining to the RECOVER budget
- Coordinate the application of available resources and personnel among the teams to best focus on priority tasks
- Review and revise the tasks and teams where needed to ensure that RECOVER meets its objectives
- Issue the annual report card
- Ensure appropriate public and agency review of RECOVER documents
- Refine the overall vision of success for the Comprehensive Plan.

The leadership group will be a standing team consisting of the co-chairs from the five RECOVER teams, plus the two RECOVER co-chairs from the Corps and the SFWMD.

### **3.2.1.2 Adaptive Assessment Team**

The Adaptive Assessment Team will be responsible for five primary tasks of RECOVER. These tasks are to 1) create, refine and provide documentation for a set of conceptual ecological models for the total system and for each of the major physiographic regions of south Florida; 2) create and refine a set of attribute-based biological performance measures for the Comprehensive Plan; 3) design and review the system-wide monitoring and data management program needed to support the Comprehensive Plan; 4) use the information coming from the system-wide monitoring program to assess actual system responses as components of the Comprehensive Plan are implemented and produce an annual assessment report describing and interpreting these responses; and 5) coordinate all scientific peer reviews of RECOVER documents. The Adaptive Assessment Team will be a standing interagency, interdisciplinary team of south Florida scientists and resource specialists.

### **3.2.1.3 Regional Evaluation Team**

The Regional Evaluation Team will perform two primary tasks: 1) review and revise the set of system-wide stressor-based performance measures and restoration targets and resolve technical issues pertaining to the performance measures; and 2) coordinate with the Project Delivery Teams and other restoration project teams during the design and evaluation of the projects, to ensure that each project either maintains or improves the level of system-wide performance predicted for the Comprehensive Plan. In addition, the Regional Evaluation Team will provide a forum for participating agencies to represent their views regarding technical issues pertaining to the performance and objectives of the Comprehensive Plan. The Regional Evaluation Team will be a standing team of resource specialists representing all agencies participating in the Comprehensive Plan process.

#### **3.2.1.4 Comprehensive Plan Refinement Team**

The Comprehensive Plan Refinement Team will have the lead responsibility for recommending refinements and improvements to the Comprehensive Plan throughout the implementation period, as new information that identifies where, how and why these improvements should be made becomes available. The Comprehensive Plan Refinement Team will link closely with the other four RECOVER teams to identify needed plan refinements and a means for incorporating these refinements into the design. The Comprehensive Plan Refinement Team will be the “keeper” of information on the most current version of the Comprehensive Plan and “without project” conditions. The Comprehensive Plan Refinement Team will be an ad hoc team that is formed each time there is a need to address a system-wide performance issue. Membership on the team will change, depending on the nature of the performance issue(s), but may include project managers, modelers, scientists and representatives from all RECOVER teams.

#### **3.2.1.5 Model Development and Refinement Team**

The Model Development and Refinement Team will be charged with the overall task of ensuring that the predictive tools used to conduct the evaluations of Comprehensive Plan components are consistent with the scales and targets set by the performance measures for each component. This team will oversee the quality of physical, water quality and ecological models and coordinate the resolution of technical issues pertaining to the models. Any necessary refinement or enhancement of system-wide tools (e.g., the South Florida Water Management Model) will also fall under this team’s purview. It will be a standing, interagency team consisting of modelers, hydrologists, engineers and natural scientists.

#### **3.2.1.6 Operations Planning Team**

The Operations Planning Team will have the lead role for coordinating and resolving system-wide operational issues associated with the implementation of the Comprehensive Plan. The team will support the Project Delivery Teams in the design of operational criteria and water control plans for each of the Comprehensive Plan components. In addition, the Operations Planning Team will work with the Adaptive Assessment Team in reviewing hydrological responses during the implementation period. It also will coordinate or recommend interim operational criteria wherever these changes may provide enhancements in the performance of the plan before all components of the plan are in place. The Operations Planning Team will consist of staff from the operations departments of the Corps and the SFWMD, with additional ad hoc members to help address specific operational criteria.

### **3.2.2 Linkages Between RECOVER Teams and Other Design Teams and Projects**

The linkages among the RECOVER teams and between RECOVER and other program management and implementation teams, which will lead to refinements in the Comprehensive Plan, are shown in Figure 3-2 as follows:



- 8) Comprehensive Plan Refinement Team makes recommendations to the Design Coordination Team for structural (future projects) or operational criteria changes needed to refine the Comprehensive Plan, based on Adaptive Assessment Team reports.
- 9) Design Coordination Team determines structural (future projects) or operational criteria changes needed to refine the Comprehensive Plan.
- 10) Recommendations from Regional Evaluation Team and Adaptive Assessment Team to the Model Refinement Team lead to development and refinement of predictive models; output from the predictive models will be used by the Regional Evaluation Team to evaluate plans.
- 11) Regional Evaluation Team reports to the Comprehensive Plan Refinement Team on changes in performance of the Comprehensive Plan due to changes that may occur from adding or revising performance measures or refining the predictive models.
- 12) Comprehensive Plan Refinement Team and Model Refinement Team link on model runs to support the Comprehensive Plan Refinement Team plan refinement exercises.
- 13) Pilot Project Study Reports go to Comprehensive Plan Refinement Team for review.
- 14) Comprehensive Plan Refinement Team recommends to Design Coordination Team refinements in the Comprehensive Plan, based on results of pilot studies.
- 15) Feasibility, other non-Comprehensive Plan project reports and water supply plans go to the Regional Evaluation Team for system-wide evaluation of effects on Comprehensive Plan performance.

### **3.2.3 RECOVER Products**

The RECOVER teams will periodically produce five categories of written reports. These reports will be for the purposes of 1) evaluating or assessing the performance of the Comprehensive Plan or its components; 2) making recommendations regarding design and operational criteria, and a system-wide monitoring/data management program for the Comprehensive Plan; 3) documenting the technical and scientific aspects of the evaluation and assessment tools used by the teams; 4) identifying and resolving technical issues pertaining to the performance measures; and 5) describing processes and guidelines used by the teams to achieve their objectives. Collectively these reports will provide a full documentation of the activities of the RECOVER teams. RECOVER reports will be peer reviewed, as appropriate, and will be provided for review and comment to the public and agencies.

Following is a brief review of the RECOVER team reports in each of the five categories.

1.
  - (A) Evaluation reports on the predicted system-wide responses of the full Comprehensive Plan, as the detailed design of each component is modeled.
  - (B) Evaluation reports on the predicted influences on the Comprehensive Plan, as each new feasibility study and other related south Florida projects are modeled.
  - (C) Evaluation reports on the performance of the Comprehensive Plan, as performance measures are added, deleted or improved.
  - (D) Assessment reports on the actual performance of the Comprehensive Plan based on information from the system-wide monitoring program, issued annually.
  - (E) An annual Report Card to inform the public of the status, trends and success of the Comprehensive Plan in meeting its objectives.

2. (A) Reports recommending the components and scope of a system-wide monitoring program and reviewing the efficacy of the monitoring/data management program.  
(B) Reports to the Design Coordination Team with any recommendations for refinements or improvements in the design and operational criteria of the Comprehensive Plan, based on evaluations and assessments of the plan's performance.
3. (A) Documentation reports for the Performance Measures.  
(B) Documentation reports for the Conceptual Ecological Models.  
(C) Documentation reports for the hydrological, water quality and ecological simulation models.
4. Reports designed to clarify or resolve any technical issues pertaining to the evaluation and assessment tools used by the teams.
5. (A) Reports describing and updating the process by which the RECOVER teams will address their tasks.  
(B) A report describing the Adaptive Assessment objectives and process.  
(C) A report that provides an overall definition of restoration success.

### **3.3 Public Outreach**

Due to the high level of public, political and media interest in the restoration of the south Florida ecosystem, public outreach is a critical component of the implementation effort. Public outreach and its two primary components, involvement and information, will continue to play a key role in the Comprehensive Plan implementation effort.

While each project will have its own public involvement and outreach requirements and activities, there is a continuing need for program-level outreach efforts. The primary objectives of the program-level public outreach activities are to 1) keep the public informed of the status of the overall program and the key issues associated with restoration implementation, and 2) provide effective mechanisms for public participation in the restoration plan development.

The overall public outreach program will be guided by a public outreach management plan that will be developed by the Corps and SFWMD and updated, as necessary. This public outreach management plan will provide a framework to link all of the elements of outreach into a coordinated set of activities that are fully integrated with the planning and implementation of Comprehensive Plan projects.

### **3.4 Socioeconomic and Environmental Justice Studies**

Implementation of the Comprehensive Plan will affect the entire region economically and socially. Although the April 1999 Feasibility Report found that the Comprehensive Plan would



have an overall positive economic effect on the region, there is the potential for some local areas to be negatively impacted. In particular, the conversion of land from agriculture to water storage in the rural areas surrounding Lake Okeechobee could eliminate the jobs of individuals employed in the affected area and have adverse effects on local communities and economies. Environmental justice involves identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of activities on minority and low-income populations. In addition, opportunities for economically and socially disadvantaged individuals and communities in urban areas of south Florida to participate in project implementation will be a goal of the implementation program.

The private sector will be involved in the planning, design and construction of the features of the Comprehensive Plan. This involvement includes technical and professional services as well as construction. Outreach efforts will be conducted to engage small businesses, minority- and women-owned businesses and disadvantaged businesses.

Although each Project Implementation Report effort will involve a number of socioeconomic and environmental justice analyses and tasks and the preparation of the appropriate National Environmental Policy Act document, there is a need to conduct program-level analyses to assess regional effects and needs. The program-level socioeconomic and environmental justice studies will be guided by a detailed management plan that will be developed by the Corps and SFWMD and updated, as necessary. The socioeconomic and environmental justice management plan will provide a framework to link all of the elements of socioeconomic and environmental justice studies into a coordinated set of activities that are fully integrated with the planning and implementation of Comprehensive Plan projects.

### **3.5 Program Management and Technical Coordination Activities**

Management of the Comprehensive Plan will require a program focus due to the large number of projects and the significant system-wide programmatic activities that are included in the plan. With the high level of interest from Congressional Representatives, Florida Legislators, government agencies, stakeholders and the general public, implementation of the program will require a significant program management and technical coordination effort. Program management and technical coordination activities will include staffing and resource allocation for program and project management activities necessary to perform various tasks including, but not limited to:

- Tracking, monitoring, and reporting of program level information and data
- Development and updating of the Master Plan
- Coordination and communications with the Corps' higher authority and the SFWMD Governing Board
- Coordination of Comprehensive Plan implementation activities with other interdependent restoration programs and projects
- Design Coordination Team tasks
- Corps-SFWMD partnering workshops and training programs
- Preparation of legislatively mandated reports
- Interaction with Federal, state, local and tribal governments

- Preparation and conduct of briefings, workshops and informal meetings with Federal, state, and local officials, state agencies and the public
- Development and dissemination of program-level strategic documents

### **3.6 Other Program Level Activities**

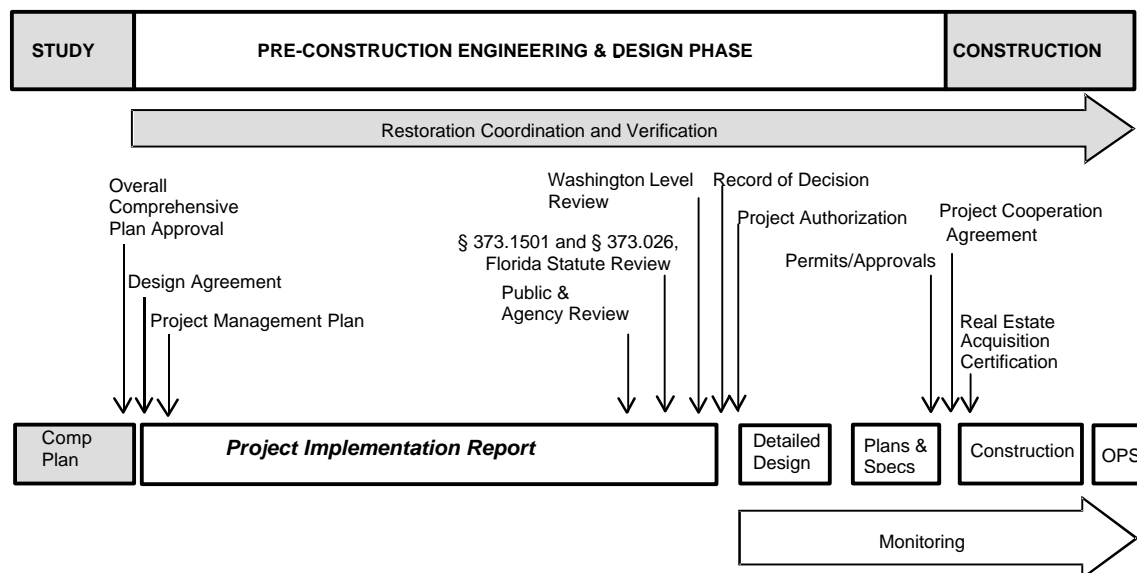
During the development of the Comprehensive Plan, a number of tasks were identified that could be accomplished as part of the pre-construction engineering and design phase. Some of these tasks were originally developed for implementation under the Critical Restoration Projects program. Appendix F, Section 7.0 describes the “other program-level” tasks that will be conducted under the Design Agreement.

## **4.0 Project Level Activities**

The features contained in the Comprehensive Plan were developed with respect to their contribution to the system-wide goals and objectives. However, due to the size and complexity of the Comprehensive Plan, implementation of the plan requires that it be divided into smaller implementable packages. These smaller packages are referred to as projects. All work pursued under the Comprehensive Plan will be documented in a management plan. In the case of project level activities, a Project Management Plan will be developed by the Corps and the SFWMD and describe the activities and products necessary to complete the project. Project Management Plans define the products and activities that will be required to complete Project Implementation Reports, Design Documentation Reports, permit applications, real estate acquisition, plans and specifications, and the construction of project features. The Project Management Plan also defines the monitoring activities and engineering tasks to support construction activities.

The purpose of this section of the Master Plan is to describe the products needed to ready a project for construction. Figure 4-1 illustrates the general steps of the project implementation process and corresponding approval points. After the Corps and SFWMD approve this Master Program Management Plan, work will begin on the individual projects. Each project will include one or more components from the Comprehensive Plan. Individual Project Management Plans, defined in more detail in Section 4.1 and Appendix B, will include a definition of the project scope; a product oriented work breakdown; a project schedule with milestones; and a detailed cost estimate. Upon public review of the Project Management Plan and approval by the Corps and the SFWMD (See Section 5.1), pre-construction engineering and design efforts will be initiated.

For most projects, a Project Implementation Report will be developed to document the plan formulation, engineering and design work. The Project Implementation Report, defined in more detail in Section 4.3 and Appendix D, will provide information to bridge the gap between the conceptual design included in the Comprehensive Plan and the detailed design necessary to advance a project to construction. The draft Project Implementation Report will be distributed for agency and public review prior to being submitted for Washington level review. The draft Project Implementation Report also will serve as the vehicle for seeking approval by the Florida Department of Environmental Protection under Section 373.1501 of the Florida Statutes. After receiving Florida Department of Environmental Protection and Washington level approvals, the Project Implementation Report will then be submitted for authorization.



**Figure 4-1**  
**Project Implementation Process**

Upon completing the Project Implementation Report, the detailed design and baseline monitoring of a project will begin. These activities and the activities during the subsequent plans and specifications phase will be further defined in scheduled revisions (discussed later in this section) to the Project Management Plan. Prior to the initiation of the construction phase, a Project Cooperation Agreement will be executed between the Corps and the SFWMD. This agreement will define responsibilities during the construction phase. Prior to the execution of this agreement, it is expected that all necessary approvals and permits will be secured.

## 4.1 Project Management Plans

The purpose of the Project Management Plan is to establish the project's scope, schedule, costs, funding requirements, and technical performance requirements, including the various functional area's performance and quality criteria that will be used to produce and deliver the products that comprise the project. Project Management Plans are intended to provide a common understanding between the SFWMD and the Corps, reduce project implementation uncertainties, and provide a basis for managing and monitoring the project. The Project Management Plans will define the activities, and where appropriate the subordinate tasks, as well as the assignment of responsibility for completing products such as Project Implementation Reports, Pilot Projects Design Reports, Design Documentation Reports, plans and specifications, real estate acquisition, construction contracts and construction, and any activities necessary to support the delivery of the projects on time and on budget.

#### **4.1.1 Project Management Plan Principles**

The Project Management Plan will reflect the SFWMD and Corps's project delivery strategy to provide a clear direction for project implementation. This section provides guiding principles for the development and implementation of Project Management Plans.

- Each project will be managed in accordance with a Project Management Plan as defined by this Master Plan.
- Opportunities for public review and involvement will be included in the Project Management Plan development schedule.
- Project Management Plans will be developed jointly by the Corps and the SFWMD.
- Project development activities will not begin until the Corps and SFWMD have formally approved a Project Management Plan for that project.
- Project Management Plans will provide a complete source of budget and schedule information for the project.
- Project Management Plans will be developed and maintained at a level of detail commensurate with the current phase of the project (e.g., high level of detail on the activities associated with the completion of a Project Implementation Report with less detail for activities associated with subsequent detailed design and construction phases).
- Project Management Plans are living documents developed by the Corps and SFWMD project managers in conjunction with their agencies functional staff and, where appropriate, other Federal, state, local and tribal government agency representatives that comprise the Project Delivery Team. Where and when appropriate the plans will be coordinated with the public.
- The project scope must be defined in sufficient detail to allow the Corps and SFWMD to establish parameters for the planning and execution of required activities (and where appropriate, subordinate tasks).
- Depending on the phase of project development, the Project Management Plans will provide a description of the proposed project features.
- The project schedule will be prepared to provide for the day-to-day management of the project.
- The project schedule will be consistent with a Work Breakdown Structure and will include appropriate document submittal, approval, and execution milestones. The Work Breakdown Structure is a product-oriented hierarchy that breaks the project down into subsequent levels of product detail.

- A project logic network for the schedule will be developed utilizing a network analysis system for the management and analysis of the project's activities. The network analysis system will provide the capability to roll up individual phases and products into an overall schedule, which depicts the major milestones.
- The project logic network will include the activities to be performed by the SFWMD and Corps, any commitments from other Federal, state, local and tribal government agencies, as well as work to be performed by architect-engineer and/or construction contractors. The logic network will be refined and adjusted throughout the life of the project.
- The project cost estimates, both baseline and current will be developed from the Work Breakdown Structure. Estimates will include contingencies based on the degree of uncertainty.
- The schedule and funding levels contained in the Project Management Plans will reflect resource-leveled data based on available program funding and other budget constraints provided by SFWMD and Corps Program Managers.
- Unless otherwise stated, where a Project Management Plan contains work to be performed by the SFWMD, the effort shall be considered work-in-kind services in accordance with procedures outlined in Section 2.2.2.4. The Project Management Plan will specifically define the products and services to be provided and a procedure for acceptance by the Corps for crediting. The costs of providing these products and services by the local sponsor will be based on the project cost estimate contained in the Project Management Plan with acceptance provided through the SFWMD's approval of the plan.
- Baseline schedules and costs will be established upon the approval of the Project Management Plan. Multiple baseline data (initial and current) will be established.
- Performance measurement of the project schedule will be based on current (actual) completion versus baseline completion.
- Adjustments to the project schedule based on changes in the project scope will be reflected in future project schedule updates/revisions and have written documentation supporting the change.
- Project costs will be developed using a common structured code of accounts.
- Project schedule milestones will be developed using a common milestone code structure.
- All activities (except milestones) will be assigned a cost based on the project cost estimate. The sum of all activities comprising the project shall equal the total project cost estimate.

#### **4.1.2 Project Management Plan Development**

General guidance on the format and content for Project Management Plans is outlined in Appendix B of this Master Plan. Appendix B also provides the mechanics for the development of a Project Management Plan and defines the output of this process.

Following the guidance provided in Appendix B will result in the production of standardized Project Management Plans. This Project Management Plans will contain standardized project network analysis system containing an activity level schedule, costs and resource data developed using a standard methodology. This information forms a data set that is supported by a set of sub-plans or “product delivery statements” that provide detailed and well-coordinated plans of action for various functional activities (e.g. public outreach, quality control, etc.). The data set, both baseline and current, will provide for the day-to-day performance monitoring and management of activities. The data set will also provide project managers and others the ability to monitor and analyze project schedule, cost and resource performance as well as support project reporting requirements.

Individual Project Management Plans, when combined with the other Project Management Plans and management plans for program-level activities, will provide Program Managers, Corps’ staff chiefs, and SFWMD managers the ability to develop program summary information for reporting and analysis. It will also provide agency executives access to this data by way of executive summary reviews and reports.

#### **4.1.3 Changes to Project Management Plans**

A Project Management Plan is a living document that will be updated or revised, as necessary, throughout the life of the project. Updates are defined as changes to the Project Management Plan that occur on a regular basis and do not substantially modify the schedule, cost or annual management plan for the project. Updates may result from posting of actual data, corrections to erroneous information, or the addition of data identified by the project managers. Updates may be made by project managers at any time and reported at each organization’s regularly scheduled reporting or status briefing (e.g. SFWMD senior management briefings or Corps Project Review meetings). Project Management Plan revisions are defined as changes that reflect significant changes in the project scope, schedule, cost and/or annual work plan. Project Management Plan revisions may be scheduled or unscheduled depending on the nature of the change and/or the occurrence of a significant event/milestone or phase of project development. Revisions to the Project Management Plan will require formal approval by the Corps and SFWMD in accordance with Section 5.0.

The Project Management Plan will undergo scheduled revisions after completion of key major project development products to reflect the changes in the project’s scope or to reflect additional or better understanding of the project’s development resulting from the completion of a decision document or design/acquisition document. The revisions will provide additional levels of detail for the upcoming project development phases based on information developed in the recently completed phase. Revisions will be scheduled upon completion of the Project Implementation Report in preparation for project design; and prior to the initiation of the construction phase to support the development and the execution of a Project Cooperation Agreement.

#### **4.1.4 Project Management Plan Approval**

After the Project Delivery Team produces the Project Management Plan and it has received the review by the appropriate Corps and SFWMD staffs, the SFWMD project manager with the concurrence of the SFWMD Program Manager will submit four original copies of the Project Management Plan to the SFWMD Executive Director for approval and signature. Upon the documents being signed, the SFWMD project manager will prepare a letter of transmittal for all four signed originals sending them to the Corps Jacksonville District. The Corps project manager, with the concurrence of the Corps Program Manager, will submit the four signed original Project Management Plans to the Project Review Board for Corps approval and signature by the Deputy District Engineer for Programs and Project Management. Upon the approval and signature by the Corps, the Corps project manager will prepare a letter transmitting two of the original signed Project Management Plans and requesting work-in-kind services from the SFWMD.

### **4.2 Pilot Projects**

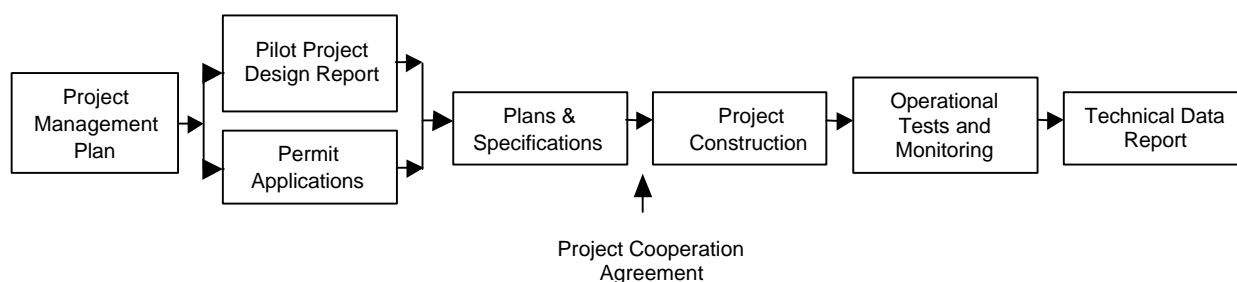
The Comprehensive Plan includes a series of pilot projects to address uncertainties associated with long-term regional scale aquifer storage and recovery, in-ground reservoir technology, Everglades seepage management and waste water reuse. The purpose of the pilot projects is to determine the feasibility, as well as optimum design, of a facility prior to embarking upon full-scale implementation of the feature. Due to the unique purpose of the pilot projects, the implementation process will be slightly different than that for the full-scale projects.

As shown in Figure 4-2, a Project Management Plan (PMP) will be developed for each pilot project. The Project Management Plan will define the scope and tasks and assign responsibility for completing the Pilot Project Design Report (PPDR), permit applications, plans and specifications, construction, operational testing and monitoring and Technical Data Reports. The type of information included in a Project Management Plan for pilot projects will be similar to that included in the Project Management Plans for Project Implementation Reports. The Project Management Plans for pilot projects will also include 1) concerns and issues to be resolved by the pilot project; 2) an investigation plan (plan formulation); 3) a field investigation plan and; 4) a scope of work for developing the Pilot Project Design Report. The Pilot Project Design Report will document the engineering design of the pilot project and will be the decision document for proceeding with plans and specifications and construction. Pilot Project Design Reports will be developed by the Project Delivery Team. There will be opportunities for public involvement at critical points in the process.

Upon completion of operational testing and monitoring, a Pilot Project Technical Data Report will be written. This technical report will document the findings and conclusions from the pilot project and will provide the basis for developing a Project Management Plan for the Project Implementation Report for the full-scale project using this technology. For example, the Lake Okeechobee Aquifer Storage and Recovery Pilot Project Technical Data Report will be used as



the basis for developing the Project Management Plan for the full-scale Lake Okeechobee Aquifer Storage and Recovery Project Implementation Report.



**Figure 4-2**  
**Pilot Project Development Process**

#### **4.2.1 Pilot Project Design Report**

The purpose of the Pilot Project Design Report is to fully develop technical information needed to construct a pilot project. This Pilot Project Design Report will include engineering and design products such as surveys and mapping, geotechnical investigations, site analyses, design optimization, construction cost estimates, economic analyses (if relevant), environmental analyses, real estate analyses and supplemental National Environmental Policy Act (NEPA) documents necessary to develop project plans and specifications. The report will also include a fully developed, detailed monitoring and testing plan. The monitoring and testing plan will describe the procedures for the investigations necessary to address the uncertainties and the technical feasibility of full-scale implementation of the feature. Work associated with the development of this report will be conducted by a multidisciplinary, interagency Project Delivery Team. There will be opportunities for public involvement at critical points during the report's development.

The Pilot Project Design Report will identify the means by which the technical concerns/issues identified will be resolved by the pilot project. As a component of the Pilot Project Design Report, the monitoring and testing plan will, at a minimum, include field data collection and technical investigations to resolve technical issues. The report will include investigations needed to support the engineering design, regulatory permits, construction techniques, construction and operational monitoring plan as well as operations of the pilot project. The report will also develop in detail the proposed costs, timelines and agency responsibilities for implementing the pilot project.

#### **4.2.2 Pilot Project Permits**

A number of permits will be required to complete the design and construction of pilot projects. For example, an Underground Injection Control Exploratory Well Permit from the Florida Department of Environmental Protection will be needed to complete design work associated with the aquifer storage and recovery pilot projects prior to the execution of the Project Cooperation

Agreement. These permits will be acquired during the development of pilot project design plans and specifications.

The plan for the acquisition of the required permits will be detailed in the Project Management Plan for the pilot project. The Corps and SFWMD project managers are responsible for the coordination necessary to successfully integrate permitting requirements with the development of the Pilot Project Design Report.

#### **4.2.3 Pilot Project Plans and Specifications**

Plans and Specifications will be prepared in the same manner as for full-scale projects as described in Section 4.7 of this document. Separate plans and specifications for the monitoring plan may need to be developed to support pre-construction monitoring necessary to document baseline conditions.

#### **4.2.4 Pilot Project Construction**

The Corps and SFWMD will develop and negotiate a Project Cooperation Agreement that defines the agency responsibilities and the terms and conditions for constructing and operating the pilot project.

#### **4.2.5 Pilot Project Operational Tests and Monitoring**

Operational tests of the pilot project will be conducted in accordance with a fully developed testing and monitoring plan described in the Pilot Project Design Report. Extensive monitoring will be conducted to gather information needed to resolve technical issues. Extensive project monitoring to ascertain the impacts of the pilot project on the surrounding aquifer will include baseline monitoring as well as operational and post-operational monitoring. The results of this monitoring will be described in the Technical Data Report documenting the project's performance.

#### **4.2.6 Pilot Project Technical Data Report**

As previously described, the data gathered from the construction and operation of the pilot project will be summarized in the Pilot Project Technical Data Report. The information in this report will be used to form the basis of the Project Management Plan for developing the Project Implementation Report covering engineering and design of a full-scale project utilizing the technology optimized in the pilot project.

### **4.3 Project Implementation Report**

The Project Implementation Report is a new type of decision document that will bridge the gap between the conceptual design contained in the Comprehensive Plan and the detailed design necessary to proceed to construction. The Project Implementation Report will more thoroughly investigate water resource solutions identified in the Comprehensive Plan and recommend

appropriate specific actions. It will be similar to a General Reevaluation Report in that it will contain additional plan formulation and evaluation and optimize the project. It will also contain additional engineering and design tasks including surveys and mapping, geotechnical investigations, site analyses, design optimization, economics, environmental analyses, flood damage assessment, real estate analyses and the preparation of supplemental National Environmental Policy Act documents.

The Project Implementation Report will document the analyses and results of the studies, and provide the basis for a final decision on the project. It will summarize the results of coordination activities such as the Fish and Wildlife Coordination Act Report and consultation under the Endangered Species Act and will serve as the document to meet the requirements of the Sections 373.1501, 373.026, and 373.470 of the Florida Statutes. As necessary, the Comprehensive Plan will be modified as components are refined and additional information is obtained during the process. The RECOVER team (Section 3.2.1) will play a key role in this analysis.

Development of the Project Implementation Report will involve additional efforts, as needed, to develop the detailed technical information to implement the project. These additional efforts will include, but will not be limited to the following:

- Additional Plan Formulation
- Engineering and Design to General Design Memorandum Levels
- Environmental Analyses
- Flood Protection Analyses
- Water Quality Analyses
- Economic Analyses
- Siting and Real Estate Analyses
- Interim Operations Plan
- Contribution to Comprehensive Plan Performance
- Refinements/Modifications to the Comprehensive Plan
- Supplemental National Environmental Policy Act Documentation
- Water Availability

The results of these additional efforts will be documented in a Project Implementation Report. The Project Management Plan will be updated at the conclusion of the Project Implementation Report. This update will detail schedules and funding requirements, and identify resource needs for detailed design and construction of the project.

The purpose of the Project Implementation Report is to affirm, reformulate or modify a project that was described in the Comprehensive Plan. All planning analyses including economic, environmental, water quality, flood protection, real estate and plan formulation conducted during pre-construction design studies will be documented and included in the Project Implementation Report. The Project Implementation Report will be the vehicle to identify, quantify and attempt to resolve the uncertainties surrounding the cost or performance of each major project. These uncertainties are not limited to the hydrologic performance of the specific project, but also include the uncertainties surrounding the expected ecosystem response to the project. A clear

description of the expected outcome of each project will be included in the Project Implementation Report.

The real estate analysis performed as part of the Project Implementation Report process will include the siting of specific project features, land interests that need to be acquired and a gross appraisal for all lands, easements and rights-of-way necessary for project construction and operation. Field investigations will be required to provide needed information for the real estate analysis, as well as for the engineering and design analysis and additional plan formulation. These activities will typically include geotechnical and environmental investigations and topographic surveys.

The National Environmental Policy Act document prepared for the Project Implementation Report will supplement the Final Programmatic Environmental Impact Statement contained in the April 1999 Final Feasibility Report, which is necessary for compliance with the National Environmental Policy Act. This document will be either an Environmental Assessment or an Environmental Impact Statement and, when practical, will be integrated into the Project Implementation Report.

The studies and preparation of each Project Implementation Report will be accomplished by an interagency, interdisciplinary Project Delivery Team. A suggested format for the Project Implementation Report is included in Appendix D.

#### **4.3.1 Public Participation and Outreach**

The ongoing extensive public participation and outreach program, described in Section 3.2, will continue throughout the Project Implementation Report process and, without losing the system-wide perspective, will become more focused on each Comprehensive Plan project. The strategy for this public participation and outreach plan is a progression of the outreach activities that began with the Restudy. It is important to continue gathering input from the diverse groups outside the Corps, the SFWMD and other agencies to assist in identifying problems, opportunities and potential solutions. This will help develop relationships critical to the success of the implementation of the recommendations of the Project Implementation Reports.

The “public” is an evolving entity and public involvement efforts must be sensitive to including all groups that are potentially impacted by project elements. Outreach efforts must identify and target those groups that may be specifically impacted. Using a checklist of factors, the outreach effort must be diligent in reaching affected groups. To determine the specific “public” the following factors will be used:

- Proximity (those who live near a proposed feature)
- Mandate (agencies that have regulatory authority)
- Use (people who may gain or lose some use)
- Economics (those who may gain or lose some economic value)
- Values (people with differing restoration views, e.g., environmentalists, private property rights activists and others)

Traditional activities will continue such as workshops for public feedback when draft project implementation reports are released. Throughout the duration of the Project Implementation Report process, however, opportunities will be developed for the public to get information outside the formal public workshop process. Other outreach activities will target specific groups of the public to promote long-term relationships and understanding of the results of the projects.

#### **4.3.2 Additional Formulation**

Additional plan formulation will include public involvement, an assessment of problems and opportunities specific to the project development, an analysis of alternatives and a selection of a final plan. Public participation and outreach, initiated in the reconnaissance phase and intensified during the feasibility phase, will continue but will become more focused on the Comprehensive Plan project. Existing conditions, future without-project conditions, problems, opportunities, fish and wildlife mitigation, commitments made during the feasibility phase and planning constraints will be reviewed and/or further developed. See Appendix D, Section 1.0, for a detailed description of tasks.

#### **4.3.3 Supplemental National Environmental Policy Act Documentation**

The April 1999 Final Feasibility Report contains a Programmatic Environmental Impact Statement. That document addresses the decision-making process, coordination, alternatives considered and environmental impacts at a general level. Additional environmental documentation will be needed for specific project components. Either an Environmental Assessment or Environmental Impact Statement will be prepared to document appropriate coordination under the Endangered Species Act, Clean Water Act, Fish and Wildlife Coordination Act, National Historic Preservation Act, Coastal Zone Management Act and other applicable laws and regulations. Appendix D, Section 2.0, contains a detailed description of these tasks.

Environmental documentation contained within the Project Implementation Reports will employ the concept of tiering to avoid duplication of paperwork by referencing relevant general and specific discussions from the Programmatic Environmental Impact Statement. Tiering was established by the Council on Environmental Quality to encourage agencies “to tier their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review” (40 CFR 1508.28 and 1502.20). This environmental documentation will build upon the Programmatic Environmental Impact Statement by addressing the individual project separable elements in sufficient detail for final decision making and for full compliance with the National Environmental Policy Act requirements.

#### **4.3.4 Economics**

The economic evaluation work to be done for a Project Implementation Report will vary in depth and scope depending on the nature of each project. Economic evaluation issues to be addressed include costs, flood damage effects, water supply impacts, the potential for impacts on fisheries, recreation and navigation, as well as social impacts. For those project actions that will affect

water elevations in urban and agricultural areas subject to damage, more detailed flood damage economic analyses will be done in concert with more detailed hydrological analyses than previously accomplished for the Comprehensive Plan. Similarly, more detailed cost evaluations will be a part of Project Implementation Reports, appropriately afforded by more detailed designs and cost data. The other impact issues of water supply, recreation, navigation, fishing and social effects will be addressed to provide a more careful focus on details and how the effects may or may not represent a significant variation from what was estimated in the April 1999 Final Feasibility Report.

#### **4.3.5 Engineering, Design, and Cost Estimates**

The engineering performed for the Project Implementation Report will include development of conceptual designs, assessment of available data and collection of any necessary new data. The engineering effort consists of evaluating plan alternatives, including the existing and future without-project conditions. The engineering members of the Project Delivery Team will also identify other alternative solutions and verify the amount and level of detail of the engineering studies and field investigations to be accomplished as previously established in the Project Management Plan. Sufficient engineering and design work should be performed to refine the project features, prepare the baseline cost estimate, develop a design and construction schedule and allow a detailed design on the selected plan to begin immediately following the approval of the Project Implementation Report. In order to properly accomplish work in a consistent and cost-effective manner, the design criteria will be described in a separate document. The design criteria document will be a compilation of pertinent design documents from both the SFWMD and the Corps with deviations identified and appropriate justification included. A discussion of applicable lessons learned will be included and updated periodically. The design criteria document will be used in performance of the work required for Design Documentation Reports as well as for Project Implementation Reports. Appendix D contains a detailed description of the elements to be included in the engineering appendices.

#### **4.3.6 Real Estate**

Real estate efforts integrated into the Project Implementation Report will identify and describe all lands, easements and rights-of-way required for the construction, operation and maintenance of the project. All known facility and utility relocations necessary to implement the project will be determined and researched to assure compensability. An estimate of land value, together with the estimated administrative and incidental costs to acquire the lands, will be prepared. The Corps and the SFWMD will fully coordinate and consult with each other throughout the drafting and approval process to ensure consistency with applicable Federal and state laws, policies, and procedures and to ensure that the expressed conclusions and plans are implementable. See Appendix D, Section 5.0, for a detailed description of tasks.

#### **4.3.7 RECOVER Evaluations and Comprehensive Plan Refinements**

Throughout the project implementation process, system-wide analyses will continue. The Regional Evaluation Team, Comprehensive Plan Refinement Team, and the Operations Planning Team of RECOVER will coordinate with the Project Delivery Teams, and each Project Implementation Report will be evaluated for its contribution to the overall system. Based upon

these evaluations, the Comprehensive Plan may need refinement to reflect the new information developed during the project development process (see RECOVER, Section 3.2). These evaluations will occur at appropriate periods during project development. A summary of the evaluation and any recommended refinement to the Comprehensive Plan, including operational changes, will be contained in each Project Implementation Report.

#### **4.3.8 Draft Water Control Plans**

Each Project Implementation Report will, as appropriate, include draft water control plans based on short and long-term implementation plan projections of other Comprehensive Plan projects. These plans will need to be developed with sufficient flexibility to accommodate the adaptive assessment approach. The draft (short-term) operational plan will indicate dependency upon, or what operational changes would occur based on, the construction and operation of other Comprehensive Plan projects (see Section 4.5).

### **4.4 Design Documentation Report**

The Design Documentation Report is an implementation document that does not require approval beyond the Jacksonville District command. It describes results of investigations, analyses and calculations made during the detailed design phase and provides the technical basis for the plans and specifications. It also serves as a summary of all engineering and design decisions made by the Project Delivery Team during project design and construction. The Design Documentation Report is not totally complete until the plans and specifications and construction phases are finished.

Appendix E provides guidance for development of the Design Documentation Report. The report will contain a full record of design decisions, assumptions and methods, subsequent to the Project Implementation Report. It will be sufficiently clear so that an engineer or other individual not familiar with the project could review the Design Documentation Report and understand how the project evolved into its final configuration, and why each key decision was made. It will be sufficiently detailed, for each technical specialty, so that the criteria which were used, the critical assumptions which were made, and the analytical methods which were used will be evident for purposes of review and historical documentation. The report will also contain summaries of important calculation results and selected example calculations for all critical elements of the design.

The Design Documentation Report will describe results of modeling and analyses conducted to initiate development of the Interim Water Control Plan (See Section 4.5). The Interim Water Control Plan will be initiated during the detailed design phase and continued during the plans and specifications phase. It will document water control operational criteria to be used during the construction phase of the project. The interim plan will be designed to maintain established levels of services during the construction phase and will describe changes to be made in operations as individual project features are completed and brought on line.

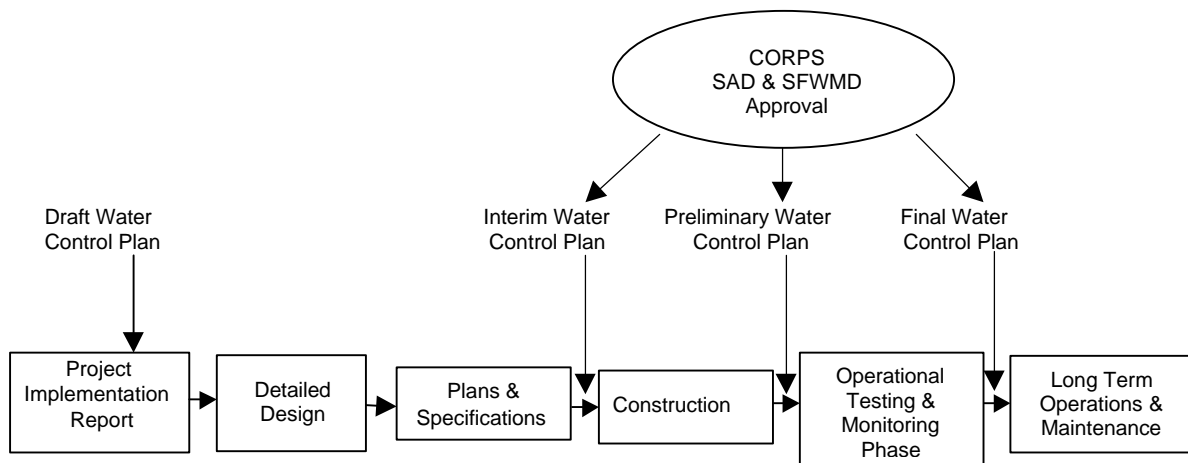
During the construction phase, design decisions made in connection with contract modifications will be added to the Design Documentation Report. The final Design Documentation Report will contain all comments and associated resolutions made during the independent technical review process. All Statements of Technical and Legal Review and the resolution of critical changes made to the project during construction will be included in the report.

## **4.5 Water Control Plans**

Water control plans include regulation schedules and operating criteria for project and/or system regulations and additional provisions as may be required to collect, analyze, and disseminate basic data, prepare detailed operating instructions, ensure project safety, and carry out the operation of projects in an appropriate manner. Most projects in the Comprehensive Plan will require some level of operational criteria. Whether a pump station or a culvert, the design of Comprehensive Plan projects will require developing operational rules and criteria, in the form of water control plans. These water control plans must ensure that the objectives of the Comprehensive Plan as well as other authorized project purposes can be met. This will require transforming the hydrologic modeling performed for the Comprehensive Plan projects into practical, real-time operational criteria and rules. The Corps and the SFWMD will jointly develop these water control plans. In the Corps, approval authority for water control plans is at the South Atlantic Division level of the U.S. Army Corps of Engineers. As such, the development of water control plans should be coordinated with the South Atlantic Division for consistency with applicable regulations.

The development of water control plans will evolve as a project evolves, as new, more detailed information becomes available during project implementation. Draft water control plans will be completed during the following phases of a project: the Project Implementation Report phase; interim water control plans during the detailed design and plans and specifications phases; preliminary water control plans prior to the completion of construction; and final water control plans during the post-construction operational testing and monitoring phase (see Figure 4-3). At any point during this process, it may be appropriate to revise whichever water control plan is operable at the time, including the "final" plan. While flexibility will be designed into the water control plans to accommodate the adaptive assessment approach to project implementation, revisions to water control plans may be necessary to account for changing conditions, assessments from the RECOVER teams, or new projects coming on line. Development of the water control plans, including revisions, will be carried out in a public process and within the framework of appropriate laws and regulations.





**Figure 4-3**  
**Water Control Plan Development**

#### **4.5.1 Draft Water Control Plans**

Each Project Implementation Report will, as appropriate, include a draft water control plan, based on short and long-term implementation plan projections of other Comprehensive Plan projects. These plans will need to be developed with sufficient flexibility to accommodate the adaptive assessment approach. The long term operational plan for complete build-out is needed to ensure that the project design will perform at its anticipated level once all Comprehensive Plan projects come on line. The draft (short-term) water control plan will indicate dependency upon, or what operational changes would occur based on, the construction and operation of other Comprehensive Plan projects. These draft operational plans will be the basis for the interim water control plans that will be developed during the detailed design phase. Development and modifications of water control plans need to account for the adaptive assessment approach embodied in the RECOVER process.

#### **4.5.2 Interim Water Control Plans**

Interim water control plans will be developed during the detailed design and plans and specifications phase for use during construction, as appropriate. Interim water control plans will focus on facilitating construction of the project while maintaining established levels of project purposes, such as water supply and flood protection. The approval process for these plans rests with the Corps South Atlantic Division and the SFWMD prior to construction.

#### **4.5.3 Preliminary Water Control Plans**

Where possible, preliminary water control plans will be prepared at least 60 days prior to completion of construction. Preliminary water control plans will focus on how the project(s) will operate during the operational testing and monitoring phase of the project, and will need to have

the flexibility to incorporate the adaptive assessment strategy in their design. The SFWMD and the Corps South Atlantic Division will approve these plans.

#### **4.5.4 Final Water Control Plans**

Final water control plans will replace preliminary water control plans after the operational testing and monitoring phase, however long that period may be as defined in the Project Cooperation Agreement for construction. At this point, the SFWMD will take on transfer authority for long-term operations and maintenance of the project(s). The SFWMD and the Corps South Atlantic Division will approve final water control plans.

### **4.6 Permits and Authorizations**

The timely processing and approval of permits and other regulatory authorizations is critical to completing design and construction on schedule and being able to operate a project once construction has been completed. To ensure that all required authorizations are processed and approved in a coordinated and timely manner, the Corps and SFWMD project managers will include staff, as necessary, from their respective regulatory/permitting divisions and a representative from the Florida Department of Environmental Protection on the Project Delivery Team. During development of the Project Management Plan for each project, the Project Delivery Team will identify a list of all permits and authorizations that are required for design, construction and operation of the project. This list, along with a schedule, milestones and agency responsibilities for obtaining the required permits, will be included in the Project Management Plan.

The Corps and the SFWMD project managers will maintain close communication and coordination to identify and address any required permit or water quality certification applications and negotiations as well as any conditions included in these authorizations. Where appropriate, final conditions on a permit or authorization will be approved by both the Corps and the SFWMD project managers prior to issuance of a draft permit or certification.

During the implementation of the Comprehensive Plan, certain general principles shall be observed:

- The Corps and the SFWMD will be jointly responsible for ensuring that projects will deliver design benefits, including flood control, water supply, water quality, environmental restoration and other authorized project purposes.
- Operating criteria to ensure delivery of project benefits will be developed, to the greatest extent possible, during the Project Implementation Report phase of each project
- If, for any reason, a project appears to fail to deliver the designed benefits, as identified through the RECOVER process, the Corps and SFWMD will both work to address the problem and take such action as necessary to ensure that the project benefits are attained.
- In as much as this is a Federal project, the Corps will not be issuing 404 permits for this effort. As is usually done for Federal projects, a 404(b)(1) evaluation will be performed.

- Transfer to Operations and Maintenance Authority will occur upon completion of the interim operational testing and monitoring period.

## **4.7 Plans and Specifications**

Plans and Specifications will be prepared by the respective engineering division in accordance with the Corps Engineer Regulation (ER) 1110-2-1200, and in accordance with Architect/Engineer/Construction CADD Standards and the Tri-Service Spatial Data Standards. They will contain all the necessary information required to bid and construct the projects detailed in the Project Implementation Report and documented in the Design Documentation Report or Pilot Project Design Report.

The preparation of plans and specifications will be scheduled to ensure that ample time is allowed for review, approval, revisions and reproductions. Construction bidding and contract documents will be prepared to pursue the goal to eliminate all conditions or practices that might delay the work or result in disputes and subsequent claims. Changes to design drawings and specifications affecting work in progress and contracts for which bids may have been received will only be made in cases of absolute necessity.

Procurement strategies will be determined for all projects by a team composed of representatives of the Corps and SFWMD. A representative of the non-procuring agency will be invited to participate on each evaluation/award team.

## **4.8 Construction Phase**

A majority of the activities that take place during the construction phase of a project are detailed specifically within a Project Cooperation Agreement. This project phase encompasses the actual construction of a project's components. Prior to the beginning of this phase, the project management plan is updated to reflect the latest project schedule and cost estimates. Also, the on-site environmental monitoring and interim water control plans are finalized and put into effect. As the construction phase comes to a close, the operation, maintenance, repair, replacement and rehabilitation manuals are completed and turned over to the local sponsor. Interim water control plans are then updated to become final water control plans.

### **4.8.1 Project Cooperation Agreement**

A Project Cooperation Agreement will be required before any project or separable element of the Comprehensive Plan is constructed. The Jacksonville District of the Corps (Jacksonville District) will prepare the Project Cooperation Agreement in accordance with the recommended plan for the separable element and in close coordination with the SFWMD. The Project Cooperation Agreement will describe the roles and responsibilities of the Corps and SFWMD for real estate acquisition, construction, construction management and operations and maintenance. The detailed schedule for the development of the Project Cooperation Agreement will be contained in the Project Management Plan.

#### **4.8.2 Engineering During Construction**

All engineering design work that takes place during construction is covered by the terms and conditions of the Design Agreement. The engineering effort during construction includes completion of the Design Documentation Report, modification of plans and specifications (where appropriate), and preparation of engineering considerations and instructions to field personnel. Additional effort is needed to review selected contractor submittals, conduct site visits, and prepare construction foundation and concrete reports. Other plans and reports prepared during construction are the embankment surveillance plan and the Hazardous Toxic Radiological Waste documentation report. Engineering also provides support for contract claims and modifications, development of Operation, Maintenance, Repair, Replacement and Rehabilitation Manuals, emergency action plans, review of as-built drawings and completion of post-construction reports documenting the project.

#### **4.8.3 Development of Monitoring Reports During and after Construction**

Each Project Delivery Team will work in close coordination with the Regional Evaluation Team of RECOVER during development of the Project Implementation Report. Together they will determine which performance measures are appropriate and which restoration targets the specific project will enhance. In order to gauge the success of the project and its components, the Project Delivery Team will, as part of the project development process, develop a monitoring plan. The monitoring plan must address the data needs of the specific performance measures identified as critical to the project. Development of the project monitoring plan will begin as soon as the Project Delivery Team determines project parameters. The monitoring plan's design must be such that it assesses the actual human and natural systems responses expected during and following the construction of the project. In addition, post-construction monitoring is expected to measure the continuing effects of project implementation on the ecosystem for several years following project completion. The status of project monitoring during the construction phase will be reflected in periodic reports to the Adaptive Assessment Team by the Project Delivery Team. These reports will aid in the assessment and possible refinement of the Comprehensive Plan based on actual environmental performance of the project. The content and format of monitoring reports will be determined on a project-by-project basis during Project Implementation Report development.

#### **4.8.4 Preliminary Water Control Plans**

Post-construction, as individual project components become operational, their performance will be monitored. This monitoring program will measure the component's performance against established performance measures to assess its contributions to the overall restoration goals for the ecosystem and other water-related needs. As analysis of a project's monitoring plan is completed, adjustments to the water control plan will be made to optimize both project and system performance (see Section 4.5).

#### **4.8.5 Finalize Operation, Maintenance, Repair, Replacement and Rehabilitation Manuals**

Each functional portion of a project or separable element will have, as part of the documentation developed for project turnover, a complete set of Operations, Maintenance, Repair, Replacement, and Rehabilitation Manuals. The Corps and the SFWMD will jointly develop these manuals. The manuals should include coverage of all operation, maintenance, repair, replacement and rehabilitation subjects identified by the Project Cooperation Agreement and applicable existing regulations, in detail sufficient to ensure proper operation, maintenance, repair, replacement and rehabilitation of the project by the SFWMD.

#### **4.8.6 Final Water Control Plan**

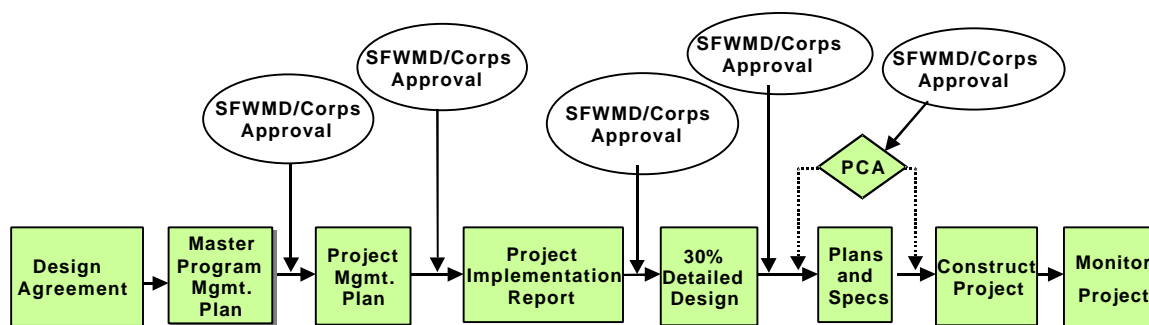
Each project will, as is suitable, have a final water control plan that will be completed during the initial operational testing and monitoring phase of the project. These final plans will draw data from several sources: the draft, interim and preliminary water control plans, results from the project's monitoring program, and additional operational analysis conducted by the RECOVER teams (see Section 4.5). The analysis of the information from these sources will be used to update the preliminary water control plan to a final operations plan for the project. This update will be captured in a water control manual for the project, as appropriate. Water control manuals are prepared to document the water control plan and serve as a reference source. Although water control manuals normally contain background information concerning physical features of the project, they do not prescribe rules or methods for physical maintenance of the facilities, which are covered in the Operations, Maintenance, Repair, Replacement, and Rehabilitation Manuals (see Section 4.8.5 above).

### **4.9 Project Closeout**

**This section to be developed in the future.**

## 5.0 Coordination and Agency Approvals

A number of design plans and products that will be developed under the auspices of the Design Agreement between the Corps and SFWMD are described in Section 4, including Project Management Plans, Project Implementation Reports, Pilot Project Design Reports, Design Documentation Reports, and Construction Plans and Specifications. Section 4 also provides a description of Project Cooperation Agreements, which are the contractual agreements that will define Corps and SFWMD responsibilities for real estate acquisition, construction, construction management and operations and management for a project. As illustrated in Figure 5-1, each of these documents, as well as updates to this Master Program Management Plan, will require approval by both the SFWMD and the Corps. Preparation of the documents will involve coordination with interagency and stakeholder groups such as the South Florida Ecosystem Restoration Task Force and Working Group and the Governor's Commission for the Everglades as well as opportunities for public participation. In addition, the Corps and SFWMD will coordinate the preparation of these documents with specific state and federal agencies to fulfill the requirements of federal and state legislation such as the Fish and Wildlife Coordination Act, the National Environmental Policy Act, the 1999 Florida Restudy Bill (i.e., Sections 373.1501 and 373.470 of the Florida Statutes) and others. This section describes approval levels for design plans and products and the technical coordination that will be performed during the development of these documents.



**Figure 5.1**  
**Project Approval**

## **5.1 Approval of Plans, Products and Agreements**

Table 5-1 summarizes the plans, products and agreements to be developed during the design and implementation of the Comprehensive Plan, along with the level of Corps and SFWMD approvals required for each document. Both Volumes I and II of the Master Program Management Plan will initially be approved by the Corps Project Review Board and the SFWMD Governing Board. Since Volume I contains primarily descriptions of processes and task descriptions and does not contain financial, resource or schedule commitments, future updates of Volume I will be approved by the SFWMD Deputy Executive Director for Water Resource Management and the Jacksonville District's Project Review Board. All substantive updates and revisions to Volume I will be documented for future reference. Because Volume II may include changes to resource and schedule commitments, annual updates to Volume II will be approved by the SFWMD Executive Director.

To facilitate decision making and approvals by the Corps and the SFWMD, regular briefings on the status of design efforts and reviews of draft documents will be provided to the Jacksonville District's Project Review Board as well as the SFWMD senior-level management and its Governing Board.

**Document Approval**  
**Table 5-1**

<b>Product or Plan</b>	<b>Document Content and Intended Use</b>	<b>Proposed Corps Approval Level</b>	<b>Proposed SFWMD Approval Level</b>
Master Program Management Plan Volume I Updates	Describes background and summary of the Comprehensive Everglades Restoration Plan and the projects covered by the Design Agreement; the management structure for the program; the development process, format, content and approval levels for design plans and products to be developed; and a description of program-level activities such as Restoration Coordination and Verification (RECOVER), public outreach, socioeconomic and environmental justice studies, and program controls. Volume I also describes the specific tasks and products to be conducted under the program-level activities.	Jacksonville District Project Review Board	Deputy Executive Director of Water Resource Management
Master Program Management Plan Volume II Updates	Includes summary of major accomplishments for prior year; updated program implementation schedule; summary of work planned, products to be completed, and cost estimates for current fiscal year and next two fiscal years for program-level activities; updated project summary sheets including schedules, milestones and cost estimates for ongoing projects.	Jacksonville District Project Review Board	SFWMD Executive Director
Project Management Plan	Defines scope, work breakdown structure, schedules, milestones, detailed cost estimates and agency responsibilities for the individual project. Approval by Corps and SFWMD is required before design work is initiated. These plans will outline work to be performed by the SFWMD for in-kind credit under Section 208 of WRDA-99.	Jacksonville District Project Review Board	SFWMD Executive Director
Project Management Plan Revisions	Provides scheduled or unscheduled changes to Project Management Plans indicating substantive changes in the level of detail for the scope, schedule changes, cost adjustments or changes in agency responsibilities for a project.	Jacksonville District Project Review Board	SFWMD Executive Director
Management Plans for Program-Level Activities	Describes the scope of work, work breakdown structure, agency responsibilities, cost estimates, schedule and milestones for program-level activities such as program controls, socioeconomic and environmental justice studies, public outreach, and RECOVER. These plans will outline work to be performed by the SFWMD for in-kind credit under Section 208 of WRDA-99.	Jacksonville District Project Review Board	SFWMD Executive Director
Project Implementation Report	Describes final results and recommendations of detailed feasibility analyses and general design work; includes site-specific design and real estate requirements, National Environmental Policy Act documentation, etc. This is a decision document that will be submitted to Florida Department of Environmental Protection for review under Chapter 373.1501 F.S. and subsequently to Secretary of Army or Congress for project authorization.	Secretary of the Army for projects included in Initial Authorization and Programmatic Authority; and Congress for all other Projects	Governing Board



Pilot Project Design Report	Describes the engineering and design basis for construction and operation of the pilot project. Report includes surveys and mapping; results of geotechnical investigations; site analyses; design optimization; construction cost estimates; real estate analyses; NEPA documentation; and a testing and monitoring plan. This is a decision document that will accompany a Project Cooperation Agreement covering construction and operational testing of a pilot project.	Corps Headquarters, Chief of Engineers	Governing Board
Design Documentation Report	Describes the engineering and design basis for construction of the project. Report includes a full record of design decisions that are made subsequent to completion of the Project Implementation Report. Report also includes surveys and mappings; results of geotechnical investigations; site analyses; design optimization; construction cost estimates; real estate analyses; and NEPA documentation.	Jacksonville District Chief of Engineering Division	Deputy Executive Director of Water Resource Management
Construction Plans and Specifications	Engineering documents showing detailed plans and specs for construction to be used for soliciting construction bids from contractors.	Jacksonville District Chief of Engineering Division	Deputy Executive Director of Water Resource Management
Project Cooperation Agreement	Contractual Agreement describing agency responsibilities, cost-sharing and in-kind work credits for real estate acquisition, construction, construction management and operations and maintenance.	Assistant Secretary of the Army for Civil Works	Governing Board

## 5.2 Coordination

Projects implemented under the Design Agreement will be accomplished with significant involvement of multiple Federal, state and local agencies, tribes and the public. Provisions contained in, but not limited to, the National Environmental Policy Act of 1969, Fish and Wildlife Coordination Act of 1958, Fish and Wildlife Conservation Act of 1980, Clean Water Act of 1972 and Endangered Species Act of 1973 require this development involvement during Project Implementation Report development. The Florida Legislature has additionally passed legislation requiring the SFWMD to coordinate with the Florida Department of Environmental Protection in the implementation of the Comprehensive Plan.

### 5.2.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 guides the civil works planning process, serving to focus the critical evaluation of the cost of today's activities in terms of tomorrow's resources. Provisions for complying with the National Environmental Policy Act are found in the Council of Environmental Quality Regulations (40 CFR 1500-1508). The National Environmental Policy Act requires that decision making should proceed with full awareness of the environmental consequences that follow from a major Federal action, which significantly affects the environment. It also contains requirements to coordinate with Federal, state and local agencies and the public as well as consideration/compliance with other environmental laws and regulations, many of which require additional coordination.

### **5.2.2 Fish and Wildlife Coordination Act**

In accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), the Corps is required to consult with the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission to seek their views and recommendations on measures to protect, conserve and mitigate for damages to fish and wildlife resources. This consultation will be initiated early in the planning process and will culminate in the preparation of the Secretary of the Interior's report to Congress in accordance with section 2(b) of the Fish and Wildlife Coordination Act Report by the U.S. Fish and Wildlife Service, as well as any report provided by the Florida Fish and Wildlife Conservation Commission.

### **5.2.3 Fish and Wildlife Conservation Act**

The Fish and Wildlife Conservation Act (16 U.S.C. SS 2901 et seq.) is intended 1) to provide financial and technical assistance to states in developing conservation plans and programs for non-game fish and wildlife; and 2) to encourage Federal agencies to utilize their authorities to promote the conservation of non-game fish and wildlife. States are invited (not required) to apply to the U.S. Fish and Wildlife Service for approval of conservation plans that contain specified required elements. If the plan is approved, the state may be reimbursed for the costs of its development as well as its implementation.

### **5.2.4 Clean Water Act**

The Federal Clean Water Act, described in the United States Code under title 33, Section 1251 et seq. (1977), contains the basic federal laws regulating discharges of pollutants to waters of the United States. Among other provisions, the Clean Water Act includes provisions regarding the establishment of water quality standards, periodic assessments of waters and water quality standards, and permitting.

Section 1313 of the Clean Water Act requires states to identify waters not meeting water quality standards, identify pollutants causing impairment, and develop a priority ranking for those waters. States are further required to develop total maximum daily loads for pollutants causing impairment. Where Comprehensive Plan project components are to be located in watersheds containing impaired waters identified by the Florida Department of Environmental Protection in their periodic reports to the U.S. Environmental Protection Agency, the Project Implementation Reports will discuss the causes of water quality impairment and the established total maximum daily loads. The Project Implementation Report also will assess the likelihood that the project will adversely affect or improve water quality in receiving waters.

Section 1341 of the Clean Water Act requires certification of compliance with water quality standards for activities involving discharges to waters. As many of the project components will involve discharges to waters, a consideration of the applicable State of Florida or Tribal water quality certification process will be included in the Project Implementation Reports. The Project Management Plans will also include water quality certification as one of the project activities.

Section 1342 of the Clean Water Act, titled National Pollutant Discharge Elimination System, requires that permits be issued for discharges of pollutants. Through delegation from the U.S. Environmental Protection Agency, the Florida Department of Environmental Protection implements the National Pollutant Discharge Elimination System requirements of the Clean Water Act through its wastewater permitting programs. If a National Pollution Discharge Elimination System operating permit is required for a project, the Project Management Plan will include acquisition of this permit as a project activity.

Section 1344 of the Clean Water Act requires compliance with specific technical and procedural requirements prior to initiating work that involves the discharge of dredge or fill material into waters of the United States. The purpose of the Clean Water Act is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” All project activities will be reviewed, as soon as possible, after preliminary concepts regarding the type and location of work are developed, to determine the applicability of Section 1344. If a proposed project includes dredge or fill activities: a) a Section 404(b)(1) evaluation of the effects will be integrated into the Project Implementation Report; b) a public notice will provide the opportunity for public hearings; and c) state water quality certification will be obtained prior to construction.

### **5.2.5 Safe Drinking Water Act**

Chapter 6A, subchapter XII, Part C, of the Federal Safe Drinking Water Act, described in United States Code under title 42, section 300f et seq., contains the Federal laws governing the protection of underground sources of drinking water. Comprehensive Plan project activities involving injection and storage of waters into aquifers will be reviewed in accordance with the requirements of the Safe Drinking Water Act regulating the protection of underground sources of drinking water. In Florida, the Safe Drinking Water Act is implemented by the Florida Department of Environmental Protection through the Underground Injection Control program, with oversight by the U.S. Environmental Protection Agency.

### **5.2.6 Endangered Species Act**

In accordance with Section 7(a)(2) of the Endangered Species Act (16 U.S.C. 1531 et seq.), no Federal actions will jeopardize the continued existence or modify designated critical habitat of federally listed species. During project planning, the U.S. Fish and Wildlife Service will be consulted to determine if federally listed species reside in the project area. If informal consultation with the Fish and Wildlife Service determines that the Federal action is “not likely to adversely affect” listed species, then no further action is required. If a proposed action is “likely to adversely affect” a federally listed species or its critical habitat, additional consultation will occur and measures will be developed to avoid or minimize adverse impacts.

### **5.2.7 State Review and Funding**

Section 373.026(8)(b) of the Florida Statutes requires the Florida Department of Environmental Protection to collaborate with the SFWMD in the implementation of the Comprehensive Plan. Before a project component is submitted to Congress for authorization or state funds are appropriated, the SFWMD must submit project documentation to the Florida Department of Environmental Protection for approval. This documentation must demonstrate that the project is

consistent with the criteria contained in Sections 373.1501(5)(a-e) of the Florida Statutes. Section 373.470(3)(c) of the Florida Statutes requires the SFWMD, in cooperation with the Corps, to complete a Project Implementation Report addressing those criteria prior to executing a Project Cooperation Agreement for the construction of a project component.

Section 373.470(6) of the Florida Statutes provides that the Florida Department of Environmental Protection will distribute funds from the State of Florida's "Save Our Everglades Trust Fund" to the SFWMD in accordance with a legislative appropriation and upon approval by the Department as described above. Requests for appropriations of state funds for the implementation of a project component are to be submitted to the Florida Department of Environmental Protection and are to be included in the Department's annual budget request to the Governor. Pursuant to Section 373.026(8)(d) of the Florida Statutes, the Executive Office of the Governor will review and approve all such proposed expenditures.

## **6.0 Annual Work Plan Requirements**

The Corps and SFWMD will update Volume II of the Master Program Management Plan, the Annual Report and Work Plan, by November 15<sup>th</sup> of each year. The Volume II update will provide a summary of major accomplishments and developments for the previous year; a summary of major milestones for the upcoming year; and a description of work tasks and cost estimates for program-level and project-level activities for the two upcoming fiscal years.

The November Volume II update also will include two appendices. Appendix A will be an updated version of the program implementation schedule - a rolled-up compilation of the schedules developed in the various Project Management Plans for individual projects and detailed management plans for program-level activities. The updated program implementation schedule will show the most up-to-date schedules for the design and construction of all projects covered under the Design Agreement. The program implementation schedule will be updated each year based on project changes, new developments, legislative changes, appropriations, staffing, resources and other factors that might impact the schedules. Appendix B of Volume II will include a two-page project summary for each project with work efforts scheduled during the period covered by the report. These project summaries will include the following information:

- A brief description of the project and project purpose
- A summary of the Corps and SFWMD responsibilities for the project design
- A project schedule, along with a list of major milestones and target completion dates
- Actual expenditures to date and a five-year projection of costs for design, real estate and construction

Appendix G provides an outline for the Annual Report and Work Plan and a template for the two-page project summaries.

The Corps and SFWMD will update Appendices A and B of Volume II in the spring of each year. A draft update of the two appendices will be completed by March 1<sup>st</sup> to guide the development of the SFWMD's upcoming fiscal year budget request. The appendices will then be updated by April 15<sup>th</sup> to include actual expenditures through the end of the second quarter (March 31). The April 15 update will be used to refine the SFWMD's budget request and support the Corps' budget update. These appendices will be updated again in the November update of the entire Volume II Annual Report and Work Plan. The November update will include actual expenditures through the end of the previous fiscal year (September 30).

## **Appendices**

**Appendix A** – Description of Comprehensive Plan Projects Included under Design Agreement

**Appendix B** – Description of Format and Content for Project Management Plans

**Appendix C** – Description of Format and Content for Pilot Project Design Reports

**Appendix D** – Description of Format and Content for Project Implementation Reports

**Appendix E** – Description of Format and Content for Design Documentation Reports

**Appendix F** – Programmatic Activities

**Appendix G** – Outline for Master Program Management Plan Volume II: Annual Report and  
Work Plan

**APPENDIX A  
PROJECT DESCRIPTIONS  
FOR THE  
COMPREHENSIVE PLAN PROJECTS INCLUDED UNDER THIS  
DESIGN AGREEMENT**

The Comprehensive Plan is comprised of 68 major components and six pilot projects representing literally hundreds of project elements. While the purpose of this Master Program Management Plan is to provide an overall management strategy to implement the Comprehensive Everglades Restoration Plan, the scope of this document is limited to the implementation of 56 components that the South Florida Water Management District has agreed to be the local sponsor. The remaining components will be implemented through other programs, such as the Critical Restoration Projects authority, or implemented with an appropriate local sponsor under separate Design Agreements and Project Management Plans.

In developing the project implementation schedule, it was necessary to reorganize components into projects that would provide immediate and separable benefits. While many of the components already meet this definition of a project, other components were interdependent requiring that they be grouped to form a project. For example, a flow distribution component that will enhance sheetflow into northwest and central Water Conservation Area 3A is dependent on improvements to the G-404 pump station to achieve the level of benefits identified in the CERP. These components were combined to create one project: Flow to Northwest and Central Water Conservation Area 3A. In addition, some components were grouped as a single project to provide the opportunity to generate a more efficient design of the components. For example, the components within North Palm Beach County were combined into the North Palm Beach County Project to address the interdependencies and tradeoffs between the different components and provide a more efficient design of the project.

Other components were separated into multiple projects in order to accelerate the implementation of separable elements of that component. For instance, due to the need to conduct the Aquifer Storage and Recovery Pilot Project, the Hillsboro Site 1 Storage Reservoir and Aquifer Storage and Recovery component was separated into the Hillsboro Site 1 Reservoir Project (Part 1) and the Hillsboro Site 1 Aquifer Storage and Recovery Project (Part 2).

The resulting 31 projects and six pilot projects to be implemented under this Master Program Management Plan are described below. The component designation that was used throughout the planning of the Comprehensive Plan is included in parentheses, e.g. (A). Other Project Elements are identified as (OPE).

## **PILOT PROJECTS**

### **P1) Lake Okeechobee Aquifer Storage and Recovery – Pilot Project**

This project is multi-purpose and provides benefits to environmental, urban and agricultural users. The pilot project is necessary to identify the most suitable sites for the aquifer storage and

recovery wells in the vicinity of Lake Okeechobee and to identify the optimum configuration of those wells. Additionally, the pilot project will determine the specific water quality characteristics of waters to be injected, the specific water quality characteristics and amount of water recovered from the aquifer, and the water quality characteristics of the receiving aquifer. Further information from the pilot project will provide the hydrogeological and geotechnical characteristics of the upper Floridan Aquifer System within the region, and the ability of the upper Floridan Aquifer System to maintain injected water for future recovery.

## **P2) Caloosahatchee River (C-43) Basin Aquifer Storage and Recovery – Pilot Project**

Aquifer Storage and Recovery wells are proposed in order to maximize the benefits associated with the Caloosahatchee River Storage Reservoir. A pilot project for these wells is necessary to identify the most suitable sites for the aquifer storage and recovery wells in the vicinity of the reservoir and to determine the optimum configuration of those wells. The pilot project will provide information regarding the characteristics of the aquifer system within the Caloosahatchee River Basin as well as determine the hydrogeological and geotechnical characteristics of the upper Floridan Aquifer. The pilot project will also determine the specific water quality characteristics of waters to be injected, the specific water quality characteristics and the amount of water recovered from the aquifer, and the water quality characteristics of water within the receiving aquifer.

## **P3) Hillsboro Site 1 Impoundment and Aquifer Storage and Recovery – Pilot Project**

The Hillsboro Site 1 above ground impoundment operates in conjunction with multiple aquifer storage and recovery wells in order to maximize the benefits of the impoundment. A pilot project for these wells is necessary to determine the most suitable sites for the aquifer storage and recovery wells in the vicinity of the impoundment and to determine the optimum configuration of those wells. The identification of the hydrogeological and geotechnical characteristics of the soils and aquifer will also be determined. The pilot project will also determine the specific water quality characteristics of water within the aquifer as well as the quality of water proposed for injection and the water quality characteristics of water recovered from the aquifer.

## **P4) In-Ground Reservoir Technology – Pilot Project**

Several projects recommend the use of areas where lime rock mining will have occurred. The initial design of these reservoirs includes subterranean seepage barriers around their perimeter in order to enable drawdown during dry periods, prevent seepage losses, and prevent water quality impacts due to transmissivity of the aquifer in these areas.

The pilot project is required to determine construction technologies, storage efficiencies, impacts on local hydrology, and water quality effects. Water quality assessments will include a determination as to whether the in-ground reservoirs and seepage barriers will allow for storage of untreated waters without concern for groundwater contamination.



#### **P5) L-31N Seepage Management – Pilot Project**

The purpose of this project is to reduce levee seepage flow across L-31N adjacent to Everglades National Park via a levee cutoff wall. Additionally, the project was designed to reduce groundwater flows during the wet season by capturing them with a series of groundwater wells adjacent to L-31N, then back-pumping those flows to Everglades National Park. The pilot project is necessary to determine the appropriate technology to control seepage from Everglades National Park. The pilot project will also provide necessary information to determine the appropriate amount of wet season groundwater flow to return that will minimize potential impacts to Miami-Dade County's West Wellfield and freshwater flows to Biscayne Bay.

#### **P6) Wastewater Reuse Technology – Pilot Project**

Currently, two projects involve the advanced treatment of wastewater. This pilot project will address water quality issues associated with discharging reclaimed water into natural areas such as the West Palm Beach Water Catchment Area, Biscayne National Park, and the Bird Drive Basin as well as determine the level of superior treatment and the appropriate methodologies for that treatment. A series of studies will be conducted to help determine the level of treatment needed.

Pilot facilities will be constructed to determine the ecological effects of using superior, advanced treated reuse water to replace and augment freshwater flows to Biscayne Bay and to determine the level of superior, advanced treatment required to prevent degradation of freshwater and estuarine wetlands and Biscayne Bay. The constituents of concern in wastewater will be identified and the ability of superior, advanced treatment to remove those constituents will be determined.

In addition, a pilot facility will be constructed to treat wastewater from the East Central Regional Wastewater Treatment Facility using advanced and superior wastewater treatment processes to remove nitrogen and phosphorus. After treatment, the wastewater will be used to restore 1500 acres of wetlands and to recharge wetlands surrounding the City of West Palm Beach's wellfield. A portion of the treated wastewater will be used to recharge a residential lake system surrounding the City's wellfield and a Palm Beach County wellfield.

Besides serving as a pilot project for wetlands based water reclamation this project will reduce a portion of the City's dependence on surface water from Lake Okeechobee during dry or drought events. In addition, approximately 2,000 acres of wetlands would be created or restored. Other benefits include aquifer recharge and replenishment, reduction of water disposed in deep injection wells and a reduction of stormwater discharge to tide.

# KISSIMMEE RIVER AND LAKE OKEECHOBEE REGION

## 1) Lake Okeechobee Watershed Project

The Lake Okeechobee Watershed Project includes four separable elements including North of Lake Okeechobee Storage Reservoir, Taylor Creek/Nubbin Slough Storage and Treatment Area, Lake Okeechobee Watershed Water Quality Treatment Facilities, and Lake Okeechobee Tributary Sediment Dredging. These components were combined for an opportunity to generate a more efficient design of the components and address the interdependencies and tradeoffs between the different components.

**1a) North of Lake Okeechobee Storage Reservoir (A).** This separable element includes an above ground reservoir and a 2,500-acre stormwater treatment area. The total storage capacity of the reservoir is approximately 200,000 acre-feet and is located in the Kissimmee River Region, north of Lake Okeechobee. The specific location of this facility has not been identified, however, it is anticipated that the facility will be located in Glades, Highlands, or Okeechobee Counties. The initial design of this separable element assumed a 20,000-acre facility (17,500-acre reservoir and 2,500-acre treatment area) with water levels in the reservoir fluctuating up to 11.5 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning, land suitability analyses, and design. Future detailed planning and design activities will also include an evaluation of degraded water bodies within the watersheds of the storage/treatment facility to determine appropriate pollution load reduction targets, and other water quality restoration targets for the watershed.

The purpose of this facility is to detain water during wet periods for later use during dry periods and reduce nutrient loads flowing to the lower Kissimmee River and Lake Okeechobee. This increased storage capacity will reduce the duration and frequency of both high and low water levels in Lake Okeechobee that are stressful to the Lake's littoral ecosystems and cause large discharges from the Lake that are damaging to the downstream estuary ecosystems. Depending upon the proposed location(s) of this water storage/treatment facility and pollutant loading conditions in the watershed(s), the facility could be designed to achieve significant water quality improvements, consistent with appropriate pollution load reduction targets.

The operation of this separable element assumes that water from Lake Okeechobee, the Kissimmee River or the S-65E drainage basin will be pumped into the storage reservoir/stormwater treatment area when the climate-based inflow model forecasts that the Lake water levels will rise significantly above desirable levels for the Lake littoral zone. Water held in the reservoir and stormwater treatment area will not be released until the lake levels decline to ecologically acceptable levels.

**1b) Taylor Creek/Nubbin Slough Storage and Treatment Area (W).** This separable element includes an aboveground reservoir with a total storage capacity of approximately 50,000 acre-feet and a stormwater treatment area with a capacity of approximately 20,000 acre-feet in the Taylor Creek/Nubbin Slough Basin. The initial design of this separable

element assumed a reservoir of 5,000 acres with water levels fluctuating up to 10 feet above grade and a stormwater treatment facility of approximately 5,000 acres. The final size, depth and configuration of this separable element will be determined through more detailed planning, land suitability analysis and design.

The purpose of this separable element is to attenuate flows to Lake Okeechobee and reduce the amount of nutrients flowing to the Lake. The separable element is designed to capture, store, and treat basin runoff during periods when levels in Lake Okeechobee are high or increasing. The water quality treatment element of this separable element is consistent with the recommendations of the South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team and the Pollution Load Reduction Goals for Lake Okeechobee developed for the Lake Okeechobee Surface Water Improvement and Management Plan (SFWMD, 1997f). The water held in the reservoir would be released to Lake Okeechobee when lake levels decline to ecologically acceptable levels.

**1c) Lake Okeechobee Watershed Water Quality Treatment Facilities (OPE).** This separable element includes two reservoir-assisted stormwater treatment areas and plugging of select local drainage ditches. The initial design of these reservoir-assisted stormwater treatment areas assumes a 1,775-acre facility in the S-154 Basin in Okeechobee County and a 2,600-acre facility in the S-65D sub-basin of the Kissimmee River Basin in Highlands and Okeechobee Counties. The plugged drainage ditches will result in restoration of approximately 3,500 acres of wetlands throughout the Lake Okeechobee watershed basin. This separable element is also consistent with the recommendations of the South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team for achieving water quality restoration objectives in the Lake and should provide significant long-term water quality benefits for the Lake.

The other portion of this separable element includes the purchase of conservation easements within four key basins of Lake Okeechobee to restore the hydrology of isolated wetlands by plugging the connection to drainage ditches and the diversion of canal flows to adjacent wetlands. The sites range in size from an individual wetland to an entire sub-basin and are located within the lower Kissimmee River Basins (S-65D, S-65E, and S-154) and Taylor Creek/Nubbin Slough Basin (S-191).

The purpose of this separable element is to attenuate peak flows and retain phosphorus before flowing into Lake Okeechobee. Further, many of the wetlands in the Lake Okeechobee watershed have been ditched and drained for agriculture water supply and flood control. This separable element will restore the hydrology of selected isolated and riverine wetlands in the region by plugging these drainage ditches.

The South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team identified six primary tributary basins (C-41 Basin, Fisheating Creek, Taylor Creek/Nubbin Slough, S-154 Basin, S-65D (Pool D) Basin, S-65E (Pool E) Basin) contributing significant phosphorus loads to the Lake. In order to further reduce nutrient loading to Lake Okeechobee in support of the water quality goals for the Lake, articulated in the Lake Okeechobee Surface Water Improvement Management Plan, there are potentially other

reservoir-assisted stormwater treatment area facilities needed in the Lake Okeechobee watershed (such as in the C-41 and Fisheating Creek Basins) that are not included in this construction separable element. Therefore, it is proposed that a comprehensive plan for the Lake Okeechobee watershed is developed before the final configuration of this construction separable element is implemented. A comprehensive Lake Okeechobee watershed plan would include elements of the Lake Okeechobee Surface Water Management Plan and remediation programs developed to achieve appropriate pollution reduction targets established for the Lake.

**1d) Lake Okeechobee Tributary Sediment Dredging (OPE).** This separable element includes the dredging of sediments from 10 miles of primary canals within an eight-basin area in the northern watershed of Lake Okeechobee. The initial design assumes that the dredged material will contain approximately 150 tons of phosphorus.

The purpose of this separable element is to remove phosphorous in canals located in areas of the most intense agriculture in the Lake Okeechobee watershed. These sediments presently contribute to the excessive phosphorus loading to Lake Okeechobee. Under separate funding, the SFWMD is planning a demonstration project consisting of sedimentation traps to determine the feasibility of phosphorous removal by this method. The project will be a two-year demonstration with construction starting in FY2000. Upon completion in 2001, the traps will be operated and monitored to determine effectiveness. If feasible, findings from this demonstration will be incorporated into the design for this separable element. This separable element is also consistent with the water quality restoration goals for the Lake included in the Lake Okeechobee Surface Water Management Plan and subsequently developed by the Lake Okeechobee Issue Team. Implementation of this separable element will also complement other activities associated with pollution reduction for the Lake.

## **2) Lake Istokpoga Regulation Schedule Project (OPE)**

This project includes the development of a plan to address water resource problems in the Lake Istokpoga Basin. Lake Istokpoga is a natural lake located in Highlands County, a tributary of Lake Okeechobee and the Kissimmee River. The major focus of this plan is to create a balance between the environmental needs, water supply and flood control in the Lake Istokpoga drainage basin.

The purpose of this plan is to examine the Lake Istokpoga Basin with a view towards enhancing fish and wildlife benefits and developing a long-term comprehensive management plan. It has been noted that operation of S-68, beginning in 1962, reduced the maximum annual fluctuation of the Lake (SFWMD, 1978). While the littoral zone expanded, the amount of quality habitat was reduced by the formation of extensive floating tussocks and dense cattail communities. Persistently lowered lake levels have reduced the natural frequency of seasonal drying and inundation. Without natural lake level fluctuations, germination of diverse aquatic plant seeds is reduced, consolidation and compaction of organic sediments cannot occur, and the formation and expansion of floating mats of water hyacinths and other species common to tussock communities are promoted. These mats reduce overall productivity and diversity of the marsh.

The plan will also address the need for flood protection for the perimeter and upstream tributaries, and for downstream areas west and east of C-41A. The plan addresses water supply needs for both the agriculture and the Seminole Tribe of Florida.

### **3) Lake Okeechobee Aquifer Storage and Recovery Project (GG)**

This total includes a series of aquifer storage and recovery wells adjacent to Lake Okeechobee with a total capacity of 1-billion gallons per day and associated pre- and post- water quality treatment in Glades and Okeechobee Counties. The initial design assumes 200 wells, each with the capacity of 5 million gallons per day with 8-ultrafiltration water quality pre-treatment facilities and aeration for post-treatment. Based on information from existing aquifer storage and recovery facilities studied, it is assumed that recovery of aquifer-stored water would have no adverse effects on water quality conditions in Lake Okeechobee. In fact, some level of nutrient load reduction may occur as a result of aquifer storage, which would be a long-term benefit to in-lake water quality conditions. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from the Lake Okeechobee Aquifer Storage and Recovery Pilot Project. The pilot project will also investigate changes to water chemistry resulting from aquifer storage and identify post-retrieval water quality treatment requirements, if any, necessary to implement aquifer storage and recovery facilities. The Comprehensive Plan includes pilot studies to investigate the feasibility of the aquifer storage and recovery facilities, including water quality changes associated with aquifer storage and recovery.

The purpose of this project is to: 1) provide additional regional storage while reducing both evaporation losses and the amount of land removed from current land use (e.g. agriculture) that would normally be associated with construction and operation of above-ground storage reservoirs; 2) increase the Lake's water storage capability to better meet regional water supply demands for agriculture, Lower East Coast urban areas and the Everglades; 3) manage a portion of regulatory releases from the Lake primarily to improve Everglades hydropatterns and to meet supplemental water supply demands of the Lower East Coast; 4) reduce harmful regulatory discharges to the St. Lucie and Caloosahatchee Estuaries and 5) maintain and enhance the existing level of flood protection.

The operation of this project assumes that after treatment, water from Lake Okeechobee will be injected into the upper Floridan Aquifer when the climate-based inflow model forecasts that the Lake water level will rise significantly above those levels that are desirable for the Lake littoral zone. During the dry season, water stored in the Floridan Aquifer will be returned to the Lake after aeration either when the Lake water level is projected to fall to within three quarters of a foot of the supply-side management line or below an established water level during the dry season.

## **CALOOSAHATCHEE RIVER REGION**

### **4) C-43 Basin Storage Reservoir Project Part 1 (D – Part 1)**

This project is the first part of the C-43 Basin Storage Reservoir and ASR component. The project includes an above ground reservoir with a total storage capacity of approximately 160,000 acre-feet located in the C-43 Basin in Hendry, Glades, or Lee Counties. The initial design of the reservoir assumed 20,000 acres with water levels fluctuating up to 8 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design.

The purpose of this project is to capture C-43 Basin runoff and releases from Lake Okeechobee. The reservoir will be designed for water supply benefits, some flood attenuation, to provide environmental water supply deliveries to the Caloosahatchee Estuary, and water quality benefits to reduce salinity and nutrient impacts of runoff to the estuary. It is assumed that, depending upon the location of the reservoir and pollutant loading conditions in the watershed, the reservoir could be designed to achieve significant water quality improvements, consistent with appropriate pollution load reduction targets.

Excess runoff from the C-43 Basin and Lake Okeechobee flood control discharges will be pumped into the proposed reservoir. Lake Okeechobee will meet any estuarine demands, not met by basin runoff as long as the lake stage is above a pre-determined level. Lake water will also be used to meet the remaining basin demands subject to supply-side management. The C-43 reservoir will also be operated in conjunction with the Caloosahatchee Back-pumping project, which includes a stormwater treatment area for water quality treatment. If the level of water in the reservoir exceeds 6.5 feet and Lake Okeechobee is below a pre-determined level, then water is released and sent to the back-pumping facility.

### **5) C-43 Basin Aquifer Storage and Recovery Project (D – Part 2)**

This project is the second part of the C-43 Basin Storage Reservoir and ASR component. This project includes aquifer storage and recovery wells with a total capacity of approximately 220 million gallons per day and associated pre- and post- water quality treatment located in the C-43 Basin in Hendry, Glades, or Lee Counties. The initial design of the wells assumed 44 wells, each with the capacity of 5 million gallons per day with chlorination for pre-treatment and aeration for post-treatment. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project (U.S. Environmental Protection Agency, 1999).

The purpose of this project is to capture C-43 Basin runoff and releases from Lake Okeechobee. The wells will be designed for water supply benefits, some flood attenuation, water quality benefits to reduce salinity and nutrient impacts of runoff to the estuary, and to provide environmental water supply deliveries to the Caloosahatchee Estuary.

Excess runoff from the C-43 Basin and Lake Okeechobee flood control discharges will be pumped into the C-43 Basin Reservoir. Water from the reservoir will be injected into the aquifer storage and recovery wellfield for long-term (multi-season) storage. Any estuarine demands, not met by basin runoff and the aquifer storage and recovery wells, will be met by Lake Okeechobee as long as the lake stage is above a pre-determined level. Lake water is also used to meet the remaining basin demands subject to supply-side management.

#### **6) Caloosahatchee Back-pumping with Stormwater Treatment Project (DDD)**

This project includes pump stations and a stormwater treatment area with a total capacity of approximately 20,000 acre-feet located in the C-43 Basin in Hendry and Glades Counties. The initial design of the stormwater treatment area assumed 5,000 acres with the water level fluctuating up to 4 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design.

The purpose of this feature is to capture excess C-43 Basin runoff, which will be used to augment regional system water supply. Backpumping will only occur after estuary and agricultural/urban demands have been met in the basin and when water levels in the C-43 storage reservoir exceed 6.5 feet above grade. Further, Lake Okeechobee water levels must be within a specified range to accept this water so as to not impact ecological resources. When these conditions are met, a series of pump stations will back-pump excess water from the reservoir and the C-43 Basin to Lake Okeechobee after treatment through a stormwater treatment area. The stormwater treatment area will be designed to meet Lake Okeechobee phosphorus and other pollutant loading reduction targets consistent with the Surface Water Improvement and Management Plan for the Lake and future appropriate pollution load reduction targets which may be developed for the Lake and the watershed in which the facility is to be located.

### **Upper East Coast Region**

#### **7) Indian River Lagoon Project**

The Indian River Lagoon Project includes three separable elements including the C-44 Basin Storage Reservoir, the C-23 and C-24 Basins Storage Reservoirs, and the C-25 and the North and South Fork Storage Reservoirs. These separable elements are all included in the ongoing Indian River Lagoon Feasibility Study.

##### **7a) C-44 Basin Storage Reservoir (B)**

This separable element includes an above ground reservoir with a total storage capacity of approximately 40,000 acre-feet located in the C-44 Basin in Martin County. The initial design of the reservoir assumed 10,000 acres with water levels fluctuating up to 4 feet above grade. The final location, size, depth and configuration of this facility will be determined through more detailed analysis to be completed as a part of the ongoing Indian River Lagoon Feasibility Study.

The purpose of this separable element is to capture local runoff from the C-44 Basin, then return the stored water to the C-44 when there is a water supply demand. The reservoir will be designed for flood flow attenuation to the estuary; water supply benefits including environmental water supply deliveries to the estuary; and water quality benefits to control salinity and reduce loading of nutrients, pesticides, and other pollutants contained in runoff presently discharged to the estuary.

#### **7b) C-23 and C-24 Storage Reservoirs (UU – Part 1)**

This separable element includes above ground reservoirs with a total storage capacity of approximately 115,200 acre-feet located in the C-23 and C-24 Basins in Martin and St. Lucie Counties. The initial design of the reservoirs assumed 14,400 acres with water levels fluctuating up to 8 feet above grade. The final location, size, depth and configuration of these facilities will be determined through more detailed analysis to be completed as a part of the Indian River Lagoon Feasibility Study. It is noted that experience from the Upper St. Johns Project reveals that greater variability of water levels are more desirable for the ecology and water quality.

The purpose of this separable element is to capture local runoff from the C-23 and C-24 Basins for flood flow attenuation to the St. Lucie River Estuary. It is assumed that these facilities can be designed to provide significant water quality improvement benefits to the Indian River Lagoon and St. Lucie River Estuary in terms of reduced loading of nutrients, pesticides, and suspended materials in stormwater runoff which is presently conveyed to those waterbodies. This water will then be used to provide both water supply and environmental water supply benefits.

#### **7c) C-25 and North Fork and South Fork Storage Reservoirs (UU – Part 2)**

This separable element includes above ground reservoirs with a total storage capacity of approximately 234,000 acre-feet located in the C-25 and the North Fork and South Fork Basins in St. Lucie and Martin Counties. The initial design of the reservoirs assumed 24,600 acres with water levels fluctuating up to 8 feet above grade and 9,350 acres with water levels fluctuating up to 4 feet above grade. The final location, size, depth and configuration of these facilities will be determined through more detailed analysis to be completed as a part of the Indian River Lagoon Feasibility Study. It is noted that experience from the Upper St. Johns Project reveals that greater variability of water levels are more desirable for the ecology and water quality.

The purpose of this separable element is to capture local runoff from the C-25 and the North Fork and South Fork Basins for flood flow attenuation to the St. Lucie River Estuary. It is assumed that these facilities can be designed to provide significant water quality improvement benefits to the Indian River Lagoon and St. Lucie River Estuary in terms of reduced loading of nutrients, pesticides, and suspended materials in stormwater runoff which is presently conveyed to those waterbodies. This water will then be used to provide both water supply and environmental water supply benefits.



## **EVERGLADES AGRICULTURAL AREA**

### **8) Everglades Agricultural Storage Reservoir Project (G – Part 1)**

This project is the first part of the of the Everglades Agricultural Area Storage Reservoir component. It includes two above ground reservoirs with a total storage capacity of approximately 240,000 acre-feet located on land associated with the Talisman Land purchase in the Everglades Agricultural Area. Conveyance capacity increases for the Miami, North New River, Bolles and Cross Canals are also included in the design of this project. The initial design for the reservoir(s) assumed 40,000 acres, divided into two, equally sized compartments with water levels fluctuating up to 6 feet above grade in each compartment. However, actual design and construction of this first phase may result in multiple reservoirs by maximizing the use of the land acquired through the Farm Bill land acquisition agreements which encompasses up to 50,000 acres.

This project is located in the Everglades Agricultural Area in western Palm Beach County on lands purchased with Department of Interior Farm Bill funds, with South Florida Water Management District funds, and on lands gained through a series of exchanges for lands being purchased with these funds. The area presently consists of land that is mostly under sugar cane cultivation. Implementation of this project will be consistent with the Farm Bill land acquisition agreements. This project will improve timing of environmental deliveries to the Water Conservation Areas by reducing damaging flood releases from the Everglades Agricultural Area to the Water Conservation Areas, reducing Lake Okeechobee regulatory releases to estuaries, meeting supplemental agricultural irrigation demands, and increasing flood protection within the Everglades Agricultural Area.

Compartment 1 of the reservoir would be used to meet Everglades Agricultural Area irrigation demands. The source of water is excess Everglades Agricultural Area runoff. Overflows to Compartment 2 could occur when Compartment 1 reaches capacity and Lake Okeechobee regulatory discharges are not occurring or impending. Compartment 2 would be used to meet environmental demands as a priority, but could supply a portion of Everglades Agricultural Area irrigation demands if environmental demands equal zero. Flows will be delivered to the Water Conservation Areas through Stormwater Treatment Areas 3 and 4. The sources of water are overflow from Compartment 1 and Lake Okeechobee regulatory releases. Compartment 2 will be operated as a dry storage reservoir and discharges made down to 18 inches below ground level.

### **9) Everglades Agricultural Storage Reservoir Project (G – Part 2)**

This project is the second part of the Everglades Agricultural Area Storage Reservoir component. It includes an above-ground reservoir with a total storage capacity of approximately 120,000 acre-feet located in the Everglades Agricultural Area in western Palm Beach County. The initial design for the reservoir assumed 20,000 acres, which would make-up the third compartment of the storage the Everglades Agricultural reservoir, with water levels fluctuating up to six feet

above grade. The need for this compartment will be determined through more detailed planning and design after Part 1 is completed.

The purpose of this project is to further improve the timing of environmental deliveries to the Water Conservation Areas, including reducing damaging flood releases from the Everglades Agricultural Area to the Water Conservation Areas and reducing Lake Okeechobee regulatory releases to the estuaries.

This last increment of storage would be used to meet environmental demands as a priority. The sources of water for this reservoir are overflow from the Part 1 reservoirs and Lake Okeechobee regulatory releases only during extreme wet events. This project will be operated as a dry storage reservoir and discharges made down to 18 inches below ground level. The project can also be designed to provide a water quality treatment function, augmenting the performance of the Everglades Construction Project and ensuring protection of water quality in the Everglades Protection Area. Design of this project for water quality performance will be based on water quality targets for the Everglades Construction Project and other water quality targets developed to protect designated uses in Everglades Agricultural Area waters.

## **BIG CYPRESS REGION**

### **10) Big Cypress/L-28 Interceptor Modifications Project (CCC)**

This project includes modification of levees and canals, water control structures, pumps, and stormwater treatment areas with a total storage capacity of 7,600 acre-feet located within and adjacent to the Miccosukee and Seminole Indian Reservations in Collier and Hendry Counties. The initial design of the stormwater treatment areas assumed a total acreage of 1,900 acres with the water level fluctuating up to 4 feet above grade. Conceptual sizes of the stormwater treatment areas were based on interim phosphorus concentration targets in the conceptual plan for the Everglades Construction Project. The final size, depth and configuration of this facility, including the stormwater treatment areas, will be determined through more detailed planning and design. Design of the stormwater treatment areas will be based on water quality criteria of the Seminole Tribe and criteria applicable to Big Cypress National Preserve, as appropriate.

The purpose of this project is to re-establish sheetflow from the West Feeder Canal across the Big Cypress Reservation and into the Big Cypress National Preserve, maintain flood protection on Seminole Tribal lands, and ensure that inflows to the North and West Feeder Canals meet applicable water quality standards. Consistency with the Seminole Tribe's Conceptual Water Conservation System master plan will be maintained.

Upstream flows entering the West and North Feeder Canals will be routed through two stormwater treatment areas to be located at the upstream ends of the canals. Sheetflow will be re-established south of the West Feeder Canal by a system to be developed consistent with the Seminole Tribe's Conceptual Water Conservation System master plan. After conversion to a pump station, S-190 will also push flows south into the L-28 Interceptor Canal where sheetflow

to the southwest will also be re-established with backfilling and degradation of the southwest levee of the canal.

## **WATER CONSERVATION AREAS AND EVERGLADES REGION**

### **11) Flow to Northwest and Central Water Conservation Area 3A Project (II and RR)**

This project includes relocation and modifications to pump stations and development of a spreader canal system located in the northwest corner and west-central portions of Water Conservation Area 3A in western Broward County.

The purpose of this project is to increase environmental water supply availability, increase depths and extend wetland hydropatterns in the northwest corner and west-central portions of Water Conservation Area 3A.

Additional flows will be directed to the northwest corner and west central portions of Water Conservation Area 3A by increasing the capacity of the G-404 pump station, currently a part of the Everglades Construction Project, and increasing the capacity and relocating the S-140 pump station. A spreader canal system at S-140 will reestablish sheetflow to the west-central portion of Water Conservation Area 3A. Water quality treatment of flows is assumed to be provided by the Everglades Construction Project and water quality treatment strategies developed to fulfill the Non-Everglades Construction Project requirements of the Everglades Forever Act. If additional treatment were determined to be required as a result of future detailed planning and design work, those existing facilities would be modified to provide the necessary treatment.

### **12) Water Conservation Area 3 Decomartmentalization and Sheetflow Enhancement Project Part 1 (QQ – Part 1 and SS – Part 2)**

Part 1 of the Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project includes the modification or removal of levees, canals, and water control structures in Water Conservation Area 3A and B located in western Broward County. This project includes backfilling the Miami Canal in Water Conservation Area 3 from one to two miles south of the S-8 pump station down to the East Coast Protective Levee. To make up for the loss of water supply conveyance to the Lower East Coast urban areas from the Miami Canal, the capacity of the North New River Canal within Water Conservation Area 3A will be doubled to convey water supply deliveries to Miami-Dade County as necessary. Modifications will also be made to the eastern section of Tamiami Trail which includes elevating the roadway through the installation of a series of bridges between L-31N Levee and the L-67 Levees. The eastern portion of L-29 Levee and Canal will also be degraded in the same area as the Tamiami Trail modifications.

The purpose of this project is to restore sheetflow and reduce unnatural discontinuities in the Everglades landscape. The project includes raising and bridging portions of Tamiami Trail and filling in portions of the Miami Canal within Water Conservation Area 3. Due to the dependencies of components, this project would be implemented with the Water Preserve Areas

Project that would create a bypass for water supply deliveries to Miami Canal using the North New River Canal.

### **13) Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project Part 1(AA and QQ – Part 2)**

Part 2 of the Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project includes the modification or removal of levees, canals, and water control structures in Water Conservation Area 3A located in western Broward County. This project includes backfilling the southern 7.5 miles of L-67A Borrow Canal, removal of the L-68A, L-67C, the western portion of L-29 below Water Conservation Area 3A, L-28, and L-28 Tieback Levees and Borrow Canals, and elevating the western portion of Tamiami Trail below Water Conservation Area 3A. Eight passive weir structures will be located along the entire length of L-67A to promote sheetflow from Water Conservation Area 3A to 3B during high flow conditions and additional water control structures will be added to the southern end of L-67A to allow for flow during extreme dry events.

The purpose of these features is to re-establish the ecological and hydrological connection between Water Conservation Areas 3A and 3B, the Everglades National Park, and Big Cypress National Preserve. The compartmentalization of the Water Conservation Areas has contributed to the loss of historic overland flows of the central Everglades slough system. This alteration of flows has resulted in temporal changes in hydropatterns and hydroperiods in the historic deepwater, central axis of the Shark River Slough system. This component adds conveyance to Water Conservation Area 3B to help re-establish natural hydroperiods and hydropatterns in the Water Conservation Areas and Shark River Slough.

### **14) Loxahatchee National Wildlife Refuge Internal Canal Structures Project (KK)**

This project includes two water control structures in the northern ends of the perimeter canals encircling the Loxahatchee National Wildlife Refuge (Water Conservation Area 1) located in Palm Beach County.

The purpose of this project is to improve the timing and location of water depths within the Refuge. It is assumed that these structures will remain closed except to pass Stormwater Treatment Area 1 East and Stormwater Treatment Area 1 West outflows and water supply deliveries to the coastal canals.

### **15) Modified Holey Land Wildlife Management Area Operation Plan Project (DD)**

This project consists of a modification to the current operating plan for Holey Land Wildlife Management Area to implement rain-driven operations for this area. Water deliveries are made to Holey Land from the Rotenberger Wildlife Management Area or from Stormwater Treatment Area 3 & 4 if Rotenberger flows are insufficient and the water quality of the deliveries are

assumed to be acceptable. These new operational rules are intended to improve the timing and location of water depths within the Holey Land Wildlife Management Area.

#### **16) Modified Rotenberger Wildlife Management Area Operation Plan Project (EE)**

This project consists of a modification to the current operating plan for Rotenberger Wildlife Management Area to implement rain-driven operations for this area. Water deliveries are made to Rotenberger from Stormwater Treatment Area 5. Discharges from Rotenberger are made to the Holey Land Wildlife Management Area. The deliveries are assumed to be of acceptable water quality. These new operational rules are intended to improve the timing and location of water depths within the Rotenberger Wildlife Management Area.

### **LOWER EAST COAST REGION**

#### **17) North Palm Beach County Project (Part 1)**

This project includes a number of separable elements including Pal-Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration, Water Preserve Areas / L-8 Basin, Lake Worth Lagoon Restoration, C-17 Backpumping and Treatment, C-51 Back-pumping and Treatment, and C-51 Regional Groundwater Aquifer Storage and Recovery. These separable elements have been combined into a single project to address the interdependencies and tradeoffs between the different elements and provide a more efficient design of the overall project.

**17a) Pal-Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration (OPE).** This element includes water control structures, canal modifications and the acquisition of 3,000 acres located between Pal-Mar and the J.W. Corbett Wildlife Management Area in Palm Beach County.

The purpose of this separable element is to provide hydrologic connections between the Corbett Wildlife Management Area and: (1) the Moss Property, (2) the C-18 Canal, (3) the Indian Trail Improvement District, and (4) the L-8 Borrow Canal, in addition to extending the spatial extent of protected natural areas. These connections would relieve the detrimental effects on native vegetation frequently experienced during the wet season and form an unbroken 126,000-acre greenbelt extending from the Dupuis Reserve near Lake Okeechobee across the J.W. Corbett Wildlife Management Area and south to Jonathan Dickinson State Park.

**17b) C-51 and Southern L-8 Reservoir (K - Part 1 and GGG).** This separable element includes a combination above ground and in-ground reservoir. The project has a total storage capacity of 48,000 acre-feet located immediately west of the L-8 Borrow Canal and north of the C-51 Canal in Palm Beach County. Other construction projects include aquifer storage and recovery wells with a capacity of 50 million gallons per day and associated pre- and post-water quality treatment to be constructed in the City of West Palm Beach (Lake Mangonia), a series of pumps, water control structures and canal capacity improvements in

the M Canal. The initial design for the reservoir assumed a 1,800-acre reservoir with 1,200 of usable acres and water levels fluctuating from 10 feet above grade to 30 feet below grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design. The initial design of the wells assumed 50 wells, each with a capacity of 5 million gallons per day with chlorination for pre-treatment and aeration for post-treatment. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project.

The purpose of this separable element is to increase water supply availability and flood protection for northern Palm Beach County areas. It will also provide flows to enhance hydroperiods in the Loxahatchee Slough, increase base flows to the Northwest Fork of the Loxahatchee River and reduce high discharges to the Lake Worth Lagoon.

Water will be pumped into the reservoir from the C-51 Canal and Southern L-8 Borrow Canal during the wet season, or periods when excess water is available, and returned to the C-51 and Southern L-8 during dry periods. Additional elements will also direct excess water into the West Palm Beach Water Catchment Area. During periods when the West Palm Beach Water Catchment Area is above desirable stages, 50 million gallons per day will be diverted to Lake Mangonia for storage in the aquifer storage and recovery wells. The reservoir portion of this component may be implemented under a previous authorization.

**17c) Lake Worth Lagoon Restoration (OPE).** This separable element includes sediment removal and trapping within the C-51 Canal and sediment removal or trapping within a 2.5 mile area downstream of the confluence of the C-51 Canal and the Lake Worth Lagoon located in Palm Beach County. A prototype facility will be conducted to determine if the Lagoon sediments will either be removed or trapped.

The purpose of this separable element is to improve water quality and allow for the re-establishment of sea grasses and benthic communities. The elimination of the organically enriched sediment from the C-51 Canal discharge will provide for long term improvements to the Lagoon and enable success for additional habitat restoration and enhancement projects planned by Palm Beach County.

**17d) C-17 Backpumping and Treatment (X).** This separable element includes backpumping facilities and a stormwater treatment area with a total storage capacity of approximately 2,200 acre-feet located in northeastern Palm Beach County. The initial design for the stormwater treatment area assumed 550 acres with water levels fluctuating up to four feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design, and will address appropriate pollution load reduction targets necessary to protect receiving waters (West Palm Beach Water Catchment Area).

The purpose of this separable element is to increase water supplies to the West Palm Beach Water Catchment Area and Loxahatchee Slough by capturing and storing excess flows currently discharged to the Lake Worth Lagoon from the C-17 Canal.

Excess C-17 Canal water will be backpumped through existing canals and proposed water control structures to the stormwater treatment area which will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area.

**17e) C-51 Back-pumping and Treatment (Y).** This separable element includes backpumping facilities and a stormwater treatment area with a total storage capacity of approximately 2,400 acre-feet located in Palm Beach County. The initial design for the stormwater treatment area assumed 600 acres in size with the water levels fluctuating up to four feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design, and will address appropriate pollution load reduction targets necessary to protect receiving waters (West Palm Beach Water Catchment Area).

The purpose of this separable element is to increase water supplies to the West Palm Beach Water Catchment Area and Loxahatchee Slough by capturing and storing excess flows currently discharged to the Lake Worth Lagoon from the C-51 Canal.

Excess C-51 Canal water will be backpumped through existing and proposed water control structures and canals to the stormwater treatment area which will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area.

## **18) North Palm Beach County Project (Part 2)**

This project includes two separable elements. The C-51 Regional Groundwater Aquifer Storage and Recovery and L-8 Basin Aquifer Storage and Recovery. These projects will provide an additional increment of storage within the North Palm Beach County region.

**18a) C-51 Regional Groundwater Aquifer Storage and Recovery (LL).** This separable element includes a series of aquifer storage and recovery wells with a total capacity of 170 million gallons per day as well as associated pre- and post- water quality treatment to be constructed along the C-51 Canal in Palm Beach County. The initial design of the wells assumed 34 well clusters, each with a capacity of 5 million gallons per day with chlorination for pre-treatment and aeration for post-treatment. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project.

The purpose of this separable element is to capture and store excess flows from the C-51 Canal, currently discharged to the Lake Worth Lagoon, for later use during dry periods.

The aquifer storage and recovery facilities will be used to inject and store surficial aquifer ground water adjacent to the C-51 Canal in the upper Floridan Aquifer instead of

discharging the canal water to tide. Water will be returned to the C-51 Canal to help maintain canal stages during the dry-season. If water is not available in the aquifer storage and recovery system, existing rules for water delivery to this region will be applied.

**18b) L-8 Basin ASR (K - Part 2).** This separable element includes a combination above ground and in-ground reservoir. Other construction projects include aquifer storage and recovery wells with a total capacity of 50 million gallons per day and associated pre- and post- water quality treatment to be constructed in the City of West Palm Beach (Lake Mangonia), a series of pumps, water control structures, and canal capacity improvements in the M Canal. The initial design for the reservoir assumed a 1,800-acre reservoir with 1,200 usable acres with the water levels fluctuating from 10 feet above grade to 30 feet below grade. The reservoir has storage capacity of approximately 48,000 acre-feet located immediately west of the L-8 Borrow Canal and north of the C-51 Canal in Palm Beach County. The final size, depth and configuration of this facility will be determined through more detailed planning and design. The initial design of the wells assumed 50 wells, each with a capacity of 5 million gallons per day with chlorination for pre-treatment and aeration for post –treatment. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project.

The purpose of this separable element is to increase water supply availability and flood protection for northern Palm Beach County areas. It will also provide flows to enhance hydroperiods in the Loxahatchee Slough; increase base flows to the Northwest Fork of the Loxahatchee River, and reduces high discharges to the Lake Worth Lagoon.

Water will be pumped into the reservoir from the C-51 Canal and Southern L-8 Borrow Canal during the wet season, or periods when excess water is available, and returned to the C-51 and Southern L-8 during dry periods. Additional separable elements move excess water into the West Palm Beach Water Catchment Area. During periods when the West Palm Beach Water Catchment Area is above desirable stages, 50 million gallons per day will be diverted to Lake Mangonia for storage in the aquifer storage and recovery wells. The reservoir portion of this component may be implemented under a previous authorization.

## **19) Water Preserve Areas A-List Project**

The Water Preserve Area A-List Project consists of 8 separable elements including Acme Basin B Discharge, Protect and Enhance Existing Wetland Systems along Loxahatchee National Wildlife Refuge including the Strazzulla Tract; Hillsboro Site 1 Impoundment; Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management and North New River Diversion; C-9 Stormwater Treatment Area/Impoundment; Dade-Broward Levee/Pennsuco Wetlands; Eastern C-4 Control Structure and Bird Drive Discharge Area. These separable elements are all included in the ongoing Water Preserve Areas Feasibility Study.



### **19a) Acme Basin B Discharge (OPE)**

This separable element includes construction of a wetland or chemical treatment area and a storage impoundment with a combined total storage capacity of 3,800 acre-feet located adjacent to the Loxahatchee National Wildlife Refuge in Palm Beach County. The initial design for the treatment area and impoundment assumed 310 acres with water levels fluctuating up to 4 feet above grade and 620 acres with the water levels fluctuating up to 8 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design.

The purpose of this separable element is to provide water quality treatment and stormwater attenuation for runoff from Acme Basin “B” prior to discharge to the Loxahatchee National Wildlife Refuge or alternative locations described below. Excess available water may be used to meet water supply demands in central and southern Palm Beach County.

Stormwater runoff from Acme Basin “B” will be pumped into the wetland treatment area and then into the storage reservoir until such time as the water can be discharged into the Loxahatchee National Wildlife Refuge. If water quality treatment criteria is not met then water will be discharged into one of two alternative locations: the Palm Beach County Agricultural Reserve Reservoir (VV) or the combination above ground and in-ground reservoir area located adjacent to the L-8 Borrow Canal and north of the C-51 Canal (GGG).

### **19b) Protect and Enhance Existing Wetland Systems along Loxahatchee National Wildlife Refuge including the Strazzulla Tract (OPE)**

This separable element includes water control structures and the acquisition of 3,335 acres located in Palm Beach County. The purpose of this separable element is to provide a hydrological and ecological connection to the Loxahatchee National Wildlife Refuge and expand the spatial extent of protected natural areas. This land will act as a buffer between higher water stages to the west and lands to the east that must be drained. This increase in spatial extent will provide vital habitat connectivity for species that require large unfragmented tracts of land for survival. It also contains the only remaining cypress habitat in the eastern Everglades and one of the few remaining sawgrass marshes adjacent to the coastal ridge. This is a unique and endangered habitat that must be protected. This area provides an essential Everglades landscape heterogeneity function.

### **19c) Hillsboro Site 1 Impoundment (M – Part 1)**

This separable element includes an above ground reservoir with a total storage capacity of approximately 15,000 acre-feet located in the Hillsboro Canal Basin in southern Palm Beach County. The initial design of the reservoir assumed 2,460 acres with water levels fluctuating up to 6 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study.

The purpose of this separable element is to supplement water deliveries to the Hillsboro Canal during dry periods thereby reducing demands on Lake Okeechobee and the Loxahatchee National Wildlife Refuge. Water from the Hillsboro Canal will be pumped into the reservoir during the wet season or periods when excess water is available. Water will be released back to the Hillsboro Canal to help maintain canal stages during the dry-season.

**19d) Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management and North New River Conveyance Improvements (Q, O and SS Part 1)**

This separable element includes canals, levees, water control structures, and a stormwater treatment area/impoundment with a total storage capacity of 6,400 acre-feet located in western Broward County. The initial design of the stormwater treatment area/impoundment assumed 1,600 acres with water levels fluctuating up to 4 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study. Detailed design of this project will address appropriate pollution load reduction targets necessary to protect receiving waters.

The purpose of this separable element is to divert and treat runoff from the western C-11 Basin that is presently discharged into Water Conservation Area 3A, control seepage from Water Conservation Areas 3A and 3B by improving groundwater elevations, and maintain flood protection for the western C-11 Basin.

Runoff in the western C-11 Canal Basin that was previously back-pumped into Water Conservation Area 3A through the S-9 pump station will be diverted into the C-11 Stormwater Treatment Area/Impoundment and then into either the North Lake Belt Storage Area, the C-9 Stormwater Treatment Area/Impoundment, or Water Conservation Area 3A after treatment, as applicable.

Mitigation of lost water supply conveyance to the Lower East Coast urban areas caused by the backfilling of the Miami canal in Water Conservation Area 3 is made up in this project. The capacity of the North New River Canal south of the proposed Everglades Agricultural Area Storage Reservoir is doubled to convey additional water supply deliveries to Miami-Dade County as necessary. The capacities of S-351 and S-150 are doubled to allow the additional water supply deliveries to be made to Miami-Dade County via the improved North New River Canal. In addition, the conveyance of the L-33 and L-37 borrow canals west of US 27 is increased as necessary to pass the additional flows.

**19e) C-9 Stormwater Treatment Area/Impoundment (R)**

This separable element includes canals, levees, water control structures and a stormwater treatment area/impoundment with a total capacity of approximately 10,000 acre-feet, located in the western C-9 Basin in Broward County. The initial design of the stormwater treatment

area/impoundment assumed 2,500 acres with water levels fluctuating up to 4 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study and will address appropriate pollution load reduction targets necessary to protect receiving waters.

The purpose of this separable element is to provide treatment of runoff stored in the North Lake Belt Storage Area, enhance groundwater recharge within the basin, maintain seepage control for Water Conservation Area 3 and buffer areas to the west, and provide flood protection for the western C-9 Basin. Seepage from the C-9 Stormwater Treatment Area/Impoundment will be collected and returned to the impoundment.

#### **19f) Dade-Broward Levee/Pennsuco Wetlands (BB)**

This separable element includes water control structures and modifications to the Dade-Broward Levee and associated conveyance system located in Miami-Dade County. The final size and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study.

The purpose of this separable element is to reduce seepage losses to the east from the Pennsuco Wetlands and southern Water Conservation Area 3B, enhance hydroperiods in the Pennsuco Wetlands, and provide recharge to Miami-Dade County's Northwest Wellfield.

#### **19g) Eastern C-4 Control Structure (T)**

This separable element consist of one water control structure located in the C-4 Canal in Miami-Dade County. The purpose of this separable element will be to enhance wetland hydroperiods and enhance recharge to several nearby Wellfields.

The eastern structure will be operated to reduce regional system deliveries by diverting dry season stormwater flows to the C-2 Canal to provide salt water intrusion protection and recharge to downstream wellfields. A western structure, being implemented under the Critical Projects Program, will be operated to control water levels in the C-4 Canal at a higher elevation to reduce seepage losses from the Pennsuco Wetlands and areas to the west of the structure.

#### **19h) Bird Drive Recharge Area (U)**

This separable element includes pumps, water control structures, canals, and an above ground recharge area with a total storage capacity of approximately 11,500 acre-feet located in western Miami-Dade County. The initial design of the recharge facility assumed 2,877 acres with the water level fluctuating up to 4 feet above grade. Final design will seek to enhance and maintain the continued viability of wetlands within the basin. The final size, depth and configuration of these facilities including treatment requirements will be determined through more detailed planning and design to be completed as a part of the

Water Preserve Areas Feasibility Study and will address appropriate pollution load reduction targets necessary to protect downstream receiving surface waters.

The purpose of the separable element is to recharge groundwater and reduce seepage from the Everglades National Park buffer area by increasing water table elevations east of Krome Avenue. The facility will also provide C-4 flood peak attenuation and water supply deliveries to the South Dade Conveyance System and Northeast Shark River Slough.

Inflows from the western C-4 Canal Basin and from the proposed West Miami-Dade Wastewater Treatment Plant will be pumped into the Recharge Area. Inflows from the wastewater treatment plant will stop when the Recharge Area depth exceeds three feet above ground and will be diverted to a deep well injection disposal system. Recharge area outflows will be prioritized to meet: 1) groundwater recharge demands, 2) South Dade Conveyance System demands and 3) Northeast Shark River Slough demands when supply is available. Regional system deliveries will be routed through the seepage collection canal system of the Bird Drive Recharge Area to the South Dade Conveyance system.

## **20) Palm Beach County Agricultural Reserve Reservoir Project (VV – Part 1)**

This project includes an above ground reservoir with a total storage capacity of approximately 20,000 acre-feet located in the western portion of the Palm Beach County Agricultural Reserve. The initial design for the reservoir assumed 1,660 acres with water levels fluctuating up to 12 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design.

The purpose of this project is to supplement water supply deliveries for central and southern Palm Beach County by capturing and storing excess water currently discharged to the Lake Worth Lagoon. These supplemental deliveries will reduce demands on Lake Okeechobee and the Loxahatchee National Wildlife Area. It is assumed that this facility could also be designed to achieve water quality improvements in downstream receiving waters, depending upon pollutant loading conditions in the watershed.

The reservoir will be filled during the wet season with excess water from the western portions of the Lake Worth Drainage District and possibly from Acme Basin B. Water will be returned to the Lake Worth Drainage District canals to help maintain canal stages during the dry-season. If water is not available in the reservoir, existing rules for water delivery to this region will be applied.

## **21) Palm Beach County Agricultural Reserve Aquifer Storage and Recovery Project (VV – Part 2)**

This project includes aquifer storage and recovery wells with a total capacity of 75 million gallons per day and associated pre- and post- water quality treatment located adjacent to the reservoir. The initial design of the wells assumed 15 well clusters, each with a capacity of 5

million gallons per day as well as chlorination for pre-treatment and aeration for post-treatment. The source of water to be injected is surficial ground water adjacent to the Palm Beach County Agricultural Reserve Reservoir. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project.

The purpose of this project is to supplement water supply deliveries for central and southern Palm Beach County by capturing and storing excess water currently discharged to the Lake Worth Lagoon. These supplemental deliveries will reduce demands on Lake Okeechobee and the Loxahatchee National Wildlife Area.

The wells will pump water into the aquifer during the wet season and will pump water from the aquifer to the Lake Worth Drainage District canals to help maintain canal stages during the dry season. If water is not available in the aquifer storage and recovery wells, existing rules for water delivery to this region will be applied.

## **22) Hillsboro Site 1 Aquifer Storage and Recovery Project (M – Part 2)**

This project includes a series of aquifer storage and recovery wells with a total capacity of approximately 150 million gallons per day and associated pre- and post- water quality treatment which will be located adjacent to the reservoir or along the Hillsboro Canal. The initial design of the aquifer storage and recovery facility assumed 30 well clusters, each with a capacity of 5 million gallons per day with chlorination for pre-treatment and aeration for post-treatment. The source of water to be injected is in the surficial ground water adjacent to the reservoir. The location, extent of treatment, and final number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project.

The purpose of this project is to supplement water deliveries to the Hillsboro Canal during dry periods thereby reducing demands on Lake Okeechobee and the Loxahatchee National Wildlife Refuge. Water will be pumped into the aquifer during the wet season or periods when excess water is available. Water will be released back to the reservoir or Hillsboro Canal to help maintain canal stages during the dry season.

## **23) Diverting Excess Water from Water from Water Conservation Areas to Central Lake Belt Storage or to Downstream Natural Areas Project (YY, ZZ and EEE)**

This project combines a number of components that include pumps, water control structures, canals and conveyance improvements located adjacent to Water Conservation Area 2 and 3 in Broward County. The final size and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study.

The purpose of this project is to attenuate high stages in Water Conservation Areas 2 and 3 and transport this excess water to Central Lake Belt Storage Area where it will be stored to meet downstream demands in Shark River Slough, Water Conservation Area 3B, or Biscayne Bay.

When stages in Water Conservation Areas 2B, 3A and 3B exceed target depths, water will be diverted to the Central Lake Belt Storage Area or to other downstream areas through water control structures and conveyance projects. Water supply deliveries will be made first to Northeast Shark River Slough, then to Water Conservation Area 3B and finally to Biscayne Bay, if flows are available. It is assumed that the water to be diverted from Water Conservation Area 2 and 3 is of adequate quality to return to the Everglades Protection Area and Biscayne Bay; however, the final size, depth and configuration of these facilities, including treatment requirements, will be determined through more detailed planning and design.

#### **24) Broward County Secondary Canal System Project (CC)**

This project includes a series of water control structures, pumps, and canal improvements located in the C-9, C-12 and C-13 Canal Basins and east basin of the North New River Canal in central and southern Broward County.

The purpose of this project is to reduce water discharges by recharging local wellfields and stabilizing the saltwater interface. Excess water in the basins will be pumped into the coastal canal systems to maintain canal stages at optimum levels. When basin water is not sufficient to maintain canal stages, the canals will be maintained from other construction projects such as the (Site1) Impoundment and the North Lake Belt Storage Area and then from Lake Okeechobee and the Water Conservation Areas.

#### **25) North Lake Belt Storage Area Project (XX)**

This project includes canals, pumps, water control structures, and an in-ground storage reservoir with a total capacity of approximately 90,000 acre-feet located in Miami-Dade County. The initial design of the reservoir assumed 4,500 acres with water levels fluctuating from ground level to 20 feet below grade. A subterranean seepage barrier will be constructed around the perimeter to enable drawdown during dry periods, to prevent seepage losses, and to prevent water quality impact due to the high transmissivity of the Biscayne Aquifer in the area. The reservoir will be located within an area proposed for rock mining. A pilot test of this component will be conducted prior to final design to determine construction technologies, storage efficiencies, impacts upon local hydrology, and water quality effects. The water quality assessment will include a determination as to whether the in-ground reservoir with perimeter seepage barrier will allow storage of untreated runoff. The final size, depth and configuration of these facilities including treatment facilities will be determined through more detailed planning and design.

The purpose of this project is to capture and store a portion of the stormwater runoff from the C-6, Western C-11 and C-9 Basins. The stored water will be used to maintain stages during the dry

season in the C-9, C-6, C-7, C-4 and C-2 Canals and to provide water deliveries to Biscayne Bay to aid in meeting salinity targets.

Runoff is pumped and gravity fed into the in-ground reservoir from the C-6 (west of Florida's Turnpike), Western C-11 and C-9 Basins. Outflows from the facility will be directed into the C-9 Stormwater Treatment Area/Impoundment for treatment prior to delivery to the C-9, C-7, C-6, C-4 and C-2 Canals. If necessary, additional stormwater treatment areas will be constructed adjacent to the in-ground reservoir.

## **26) Central Lake Belt Storage Area Project (S)**

This project includes pumps, water control structures, a stormwater treatment area, and a combination above ground and in-ground storage reservoir with a total storage capacity of approximately 190,000 acre-feet located in Miami-Dade County. The initial design of the reservoir assumed 5,200 acres with water levels fluctuating from 16 feet above grade to 20 feet below grade. A subterranean seepage barrier will be constructed around the perimeter to enable drawdown during dry periods and to prevent seepage losses. A pilot test of this technology will be conducted prior to final design of this component to determine construction technologies, storage efficiencies, impacts upon local hydrology, and water quality effects. Since this facility is to be located within the protection area of Miami-Dade County's Northwest Wellfield, the pilot test will also be designed to identify and address potential impacts to the County's wellfield which may occur during construction and/or operation. The stormwater treatment area was assumed to be 640 acres with the water level fluctuating up to 4 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design.

The purpose of the project is to store excess water from Water Conservation Areas 2 and 3 and provide environmental water supply deliveries to: 1) Northeast Shark River Slough, 2) Water Conservation Area 3B, and 3) to Biscayne Bay, in that order, if available. Due to the source of the water (Water Conservation Areas 2 and 3), it is assumed that water stored in this facility is of adequate quality to return to the Everglades Protection Area and Biscayne Bay; however, the final size, depth and configuration of these facilities, including treatment requirements, will be determined through more detailed planning and design.

Excess water from Water Conservation Areas 2 and 3 will be diverted into the L-37, L-33, and L-30 borrow canals, which run along the eastern boundaries of the Water Conservation Areas, and pumped into the Central Lake Belt Storage Area. Water supply deliveries will be pumped through a stormwater treatment area prior to discharge to the Everglades via the L-30 borrow canal and a reconfigured L-31N borrow canal. If available, deliveries will be directed to Biscayne Bay through the Snapper Creek Canal at Florida's Turnpike. A structure will be provided on the Snapper Creek Canal to provide regional system deliveries when water from the Central Lake Belt Storage Area is not available.

## **27 Everglades National Park Seepage Management Project (V and FF)**

This project includes relocating and enhancing L-31N, groundwater wells, and sheetflow delivery system adjacent to Everglades National Park located in Miami-Dade County. More detailed planning, design and pilot studies will be conducted to determine the appropriate technology to control seepage from Everglades National Park. These studies and tests will also determine the appropriate amount of wet season groundwater flow control that will minimize potential impacts to Miami-Dade County's West Wellfield and freshwater flows to Biscayne Bay.

The purpose of this project is to improve water deliveries to Northeast Shark River Slough and restore wetland hydropatterns in Everglades National Park by reducing levee and groundwater seepage and increasing sheetflow.

This project reduces levee seepage flow across L-31N adjacent to Everglades National Park via a levee cutoff wall. Groundwater flows during the wet season are captured by ground water wells adjacent to L-31N and pumped back to Everglades National Park. Water from upstream natural areas will be diverted into a buffer area adjacent to Everglades National Park where sheetflow will be reestablished. Further, this project includes relocation of the Modified Water Deliveries structure S-357 to provide more effective water deliveries to Everglades National Park. New discharges to Everglades National Park will be designed to meet applicable water quality criteria.

## **28) Biscayne Bay Coastal Wetlands Project (FFF and OPE)**

This project includes pump stations, spreader swales, stormwater treatment areas, flowways, levees, culverts, and backfilling canals located in southeast Miami-Dade County and covers 13,600 acres from the Deering Estate at C-100C, south to the Florida Power and Light Turkey Point power plant, generally along L-31E.

The purpose of this project is to rehydrate wetlands and reduce point source discharge to Biscayne Bay. The proposed project will replace lost overland flow and partially compensate for the reduction in groundwater seepage by redistributing, through a spreader system, available surface water entering the area from regional canals. The proposed redistribution of freshwater flow across a broad front is expected to restore or enhance freshwater wetlands, tidal wetlands, and nearshore bay habitat. Sustained lower-than-seawater salinities are required in tidal wetlands and the nearshore bay to provide nursery habitat for fish and shellfish. This project is expected to create conditions that will be conducive to the re-establishment of oysters and other components of the oyster reef community. Diversion of canal discharges into coastal wetlands is expected not only to re-establish productive nursery habitat all along the shoreline but also to reduce the abrupt freshwater discharges that are physiologically stressful to fish and benthic invertebrates in the bay near canal outlets.

More detailed analyses will be required to define target freshwater flows for Biscayne Bay and the wetlands within the redistribution system. The target(s) will be based upon the quality, quantity, timing and distribution of flows needed to provide and maintain sustainable biological



communities in Biscayne Bay, Biscayne National Park and the coastal wetlands. Additionally, potential sources of water for providing freshwater flows to Biscayne Bay will be identified and evaluated to determine their ability to provide the target flows.

The component Biscayne Bay Coastal Canals as modeled in D-13R and the Critical Project on the L-31E Flowway Redistribution are smaller components of the Biscayne Bay Coastal Wetlands project described above.

### **29) C-111N Spreader Canal Project (WW)**

This project includes levees, canals, pumps, water control structures, and a stormwater treatment area to be constructed, modified or removed in the Model Lands and Southern Glades (C-111 Basin) area of Miami-Dade County. This project enhances the C-111 Project design for the C-111N Spreader Canal with the construction of a stormwater treatment area, the enlarging of pump station S-332E and the extension of the canal under U.S. Highway 1 and Card Sound Road into the Model Lands. The initial design of this project pumps water from the C-111 and the C-111E Canals into a stormwater treatment area prior to discharging to Southern Everglades and Model Lands. This projects also calls for filling in the southern reach of the C-111 Canal and removal of structures S-18C and S-197. The final size, depth, location and configuration of this project will be determined through more detailed planning and design.

The purpose of this project is to improve deliveries and enhance the connectivity and sheetflow in the Model Lands and Southern Glades areas, reduce wet season flows in C-111, and decrease potential flood risk in the lower south Miami-Dade County area.

## **SOUTHWEST FLORIDA REGION**

### **30) Southern Golden Gate Estates Restoration Project (OPE)**

This project includes a combination of spreader channels, canal plugs, road removal and pump stations in the Western Basin and Big Cypress, Collier County, south of I-75 and north of U.S. 41 between the Belle Meade Area and the Fakahatchee Strand State Preserve.

The purpose of this project is to restore and enhance the wetlands in Golden Gate Estates and in adjacent public lands by reducing over-drainage. Implementation of the restoration plan would also improve the water quality of coastal estuaries by moderating the large salinity fluctuations caused by freshwater point discharge of the Fahka Union Canal. The plan would also aid in protecting the City of Naples' eastern Golden Gate wellfield by improving groundwater recharge.

## FLORIDA BAY AND KEYS REGION

### 31) Florida Keys Tidal Restoration Project (OPE)

This project includes the use of bridges or culverts to restore the tidal connection between Florida Bay and the Atlantic Ocean in Monroe County. The four locations are as follows: 1) Tarpon Creek, just south of Mile Marker 54 on Fat Deer Key (width 150 feet); 2) unnamed creek between Fat Deer Key and Long Point Key, south of Mile Marker 56 (width 450 feet); 3) tidal connection adjacent to Little Crawl Key (width 300 feet); and 4) tidal connection between Florida Bay and Atlantic Ocean at Mile Marker 57 (width 2,400 feet).

The purpose of this project is to restore the tidal connection that was eliminated in the early 1900's during the construction of Flagler's railroad. Restoring the circulation to areas of surface water that have been impeded and stagnant for decades will significantly improve water quality, benthic floral and faunal communities, larval distribution of both recreational and commercial species (i.e. spiny lobster), and the overall hydrology of Florida Bay.

## Operational Modifications

There are several operational components that will be implemented as integral features of the projects listed in Table A-1. While these components do not require additional congressional action to implement, they will be included in the studies necessary to further the project to completion. Further, other operational changes will be implemented as part of other existing State Programs. These projects are critical to the success of the Comprehensive Plan and implementation of these projects will be funded and monitored through the Recover Process.

**OPERATIONAL COMPONENTS COVERED BY THE  
MASTER PROGRAM MANAGEMENT PLAN  
Table A-1**

#	Project	Explanation	Projects
32	Lake Okeechobee Regulation Schedule (F)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• Lake Okeechobee Watershed Project</li> <li>• Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>• C-43 Basin Storage Reservoir and ASR Projects</li> <li>• Caloosahatchee Backpumping with Stormwater Treatment Project</li> <li>• Indian River Lagoon Project</li> <li>• Everglades Agricultural Storage Reservoir Projects</li> <li>• North Palm Beach County Projects</li> <li>• Water Preserve Areas A-List Project</li> <li>• Palm Beach County Agriculture Reserve Reservoir Projects</li> <li>• Hillsboro Site 1 Impoundment and ASR Project</li> </ul>

#	Project	Explanation	Projects
			<ul style="list-style-type: none"> <li>• Diverting Water Conservation Areas to central Lake Belt Storage to Downstream Natural Areas Project</li> <li>• Broward County Secondary Canal System Project</li> <li>• North Lake Belt Storage Area Project</li> <li>• Central Lake Belt Storage Project</li> </ul>
33	Environmental Water Supply Deliveries to the Caloosahatchee Estuary (E)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• Lake Okeechobee Watershed Project</li> <li>• Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>• C-43 Basin Storage Reservoir and ASR Projects</li> <li>• Caloosahatchee Backpumping with Stormwater Treatment Project</li> <li>• Everglades Agricultural Storage Reservoir Projects</li> </ul>
34	Environmental Water Supply Deliveries to the St. Lucie Estuary (C)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• Lake Okeechobee Watershed Project</li> <li>• Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>• Indian River Lagoon Project</li> <li>• Everglades Agricultural Storage Reservoir Projects</li> </ul>
35	Everglades Rain Driven Operations (H)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• Lake Okeechobee Watershed Project</li> <li>• Lake Okeechobee Aquifer Storage and Recovery Project</li> <li>• Caloosahatchee Backpumping with Stormwater Treatment Project</li> <li>• Everglades Agricultural Storage Reservoir Projects</li> <li>• Big Cypress/L-28 Interceptor Modifications Project</li> <li>• Flow to Northwest and Central Water Conservation Area 3A Project</li> <li>• Water Conservation Area 3 Decompartmentalization and Sheet Flow Enhancement Projects</li> <li>• Loxahatchee National Wildlife Refuge Internal Canal Structures Project</li> <li>• Water Preserve Areas Projects</li> <li>• Diverting Water Conservation Areas to Central Lake Belt Storage to Downstream Natural Areas Project</li> <li>• North Lake Belt Storage Area Project</li> <li>• Central Lake Belt Storage Project</li> <li>• Everglades National Park Seepage Management Project</li> </ul>
36	Change Coastal Wellfield Operations (L)	Implement under existing State process	RECOVER will monitor progress
37	Lower East Coast Utility Water Conservation (AAA)	Implement under existing State process	RECOVER will monitor progress

#	Project	Explanation	Projects
38	Operational Modifications to Southern Portion of L-31N and C-111(OO)	Operational change only; implement with appropriate projects	<ul style="list-style-type: none"> <li>• C-111 Project (ongoing)</li> <li>• C-111N Spreader Canal Project</li> <li>• Everglades National Park Seepage Management Project</li> </ul>

**APPENDIX B**

**DESCRIPTION OF FORMAT AND CONTENT  
FOR  
PROJECT MANAGEMENT PLANS**

## **1.0 Introduction to Project Management Plan Development**

Project managers will develop Project Management Plans for each project pursued under the Design Agreement executed between the Secretary of the Army and the SFWMD. In order to provide consistency between projects and ensure that all management plans can be consolidated into a multi-project program-level view, Project Management Plans will conform to basic format, content and structure provided in this appendix. As previously stated in Section 4.1 of this Master Plan, the purpose of a Project Management Plan is to provide a project-level implementation strategy for all project development phases (planning, engineering and design, and construction). Project Management Plans are not intended to be all-inclusive nor to anticipate or include all possible changes to a project during the lifecycle of its development. The plans should be developed as dynamic documents that will require periodic updates to reflect progress, and revisions to reflect major changes in the scope, schedule, cost and/or resourcing of the project. Project Management Plans are stand-alone documents that provide all scheduling and cost information necessary to implement the project.

This appendix provides guidance to project managers involved in the efforts to implement the SFWMD's segment of the Comprehensive Everglades Restoration Plan. It provides guidance and recommendations on the project development process as well as the required format and content of a Project Management Plan. The guidance contained within this appendix is intended to be general in nature as it is expected that each project will have unique requirements. The Corps and the SFWMD will utilize a Project Management Business Process, as described in the Corps' Engineer Regulation 5-1-11, as the standard business practice for the execution of the Comprehensive Plan.

The first part of Appendix B provides the expected format and section headings that will, as applicable, comprise a Project Management Plan. The next section provides guidance and, when available, recommended language for each of the sections of the Project Management Plan.

### **1.1 Project Management Plan Initiation**

A Project Management Plan begins with the following series of actions which then lead to the development of an approved plan.

- Assignment of SFWMD and Corps project managers
- Establishment of the membership for the Project Delivery Team
- Establishment of the membership for the Independent Technical Review Team
- Development of a general project scope and preliminary draft Project Management Plan

- Creation of a project concept package which details project parameters
- Completion of the final draft of the Project Management Plan (Project Implementation Report phase)
- Concurrence by Design Coordination Team
- Public and agency review of the Project Management Plan
- Finalization of the Project Management Plan addressing public and agency review comments
- Corps and SFWMD approval of the Project Management Plan

Once these steps are completed, implementation of the plan will be initiated.

## **2.0 Project Management Plan Format**

### **2.1 Project Management Plan Assembly**

Project Management Plans will be assembled as 8-1/2 by 11 inch documents in separate three-ring binders for easy updating. The cover will be yellow cardstock consistent with other Central and Southern Florida Project documents produced by the Corps. The Project Management Plans will be produced in black and white with the text in 12 point Times New Roman font. The document should be constructed in a manner that will allow for electronic posting to a website.

### **2.2 Project Management Plan Sections and Appendices**

The basic Project Management Plan will be structured to provide a main body and a series of appendices with supplemental tabs.

#### **2.2.1 Project Management Plan Main Body**

For most projects, the main body of the Project Management Plan will contain the following sections and sub-sections. In cases where a section is not applicable, the section should remain and noted accordingly.

- 1.0 Project Information
  - 1.1 Description
  - 1.2 Authority
  - 1.3 Background
  - 1.4 Related Projects
  - 1.5 Differences from the Comprehensive Plan
- 2.0 Project Scope
- 3.0 Work Breakdown Structure
- 4.0 Organization Breakdown Structure
- 5.0 Change Control Procedures
- 6.0 Project Schedule Development
  - 6.1 Activity List
  - 6.2 Activity Sequence

- 6.3 Logic Network
- 6.4 Activity Duration Estimates
- 6.5 Project Schedule
- 6.6 Data Set
- 7.0 Project Cost Estimating
- 8.0 Funding Requirements
- 9.0 Functional Area Plans
  - 9.1 Advanced Formulation and Planning
  - 9.2 Engineering and Design
  - 9.3 Construction Management
  - 9.4 Real Estate
  - 9.5 Contracting and Acquisition
  - 9.6 Quality Control
  - 9.7 Permitting
  - 9.8 Public Outreach and Involvement
  - 9.9 Environmental and Ecological
  - 9.10 Value Engineering
  - 9.11 Water Control
  - 9.12 Operations and Maintenance
  - 9.13 Socioeconomics
  - 9.14 Environmental Justice
- 10.0 Restoration Coordination and Verification (RECOVER) Integration
- 11.0 Project Cooperation Agreement
- 12.0 Project Closeout Procedures
- 13.0 List of Project Management Plan Preparers
- 14.0 Summary of Work-In-Kind Services
- 15.0 Reference Documents and Forms
- 16.0 Summary of Changes

## **2.2.2 Project Management Plan Appendices**

The Project Management Plan appendices will contain the “project record.” A series of separate appendices will be established to organize the documentation for various aspects of the project. As the project progresses, new or revised information will become available. This information may be in the form of correspondence, reports, or memorandums for the record that comprise the documentation of the progress and/or actions related to the project. This documentation will be captured in the Project Management Plan in one of a series of subject area appendices.

Generally the Project Management Plan will include the appendices listed below. Since the implementation of the Comprehensive Plan projects spans several phases and provisions have been made to revise the Project Management Plans when phases change, not all appendices must be completed at the time of initial development and approval (e.g. the Construction Management Plan). However, the appendices and tabs should be created as placeholders for filing information and documents during the course of project implementation and in the case where the appendix will not be used, noted accordingly.

- Appendix A:** Project Map
- Appendix B:** Work Breakdown Structure
  - TAB A – Scope Verification Documentation
- Appendix C:** Organization Breakdown Structure
  - TAB A – Project Activity List by Organization
- Appendix D:** Project Schedule
  - TAB A – Project Activity List by Date
  - TAB B – Project Milestone List
  - TAB C – Project Gantt Chart
  - TAB D – Constraints and Assumptions
- Appendix E:** Project Cost Estimate
  - TAB A – Total Project Cost Summary
  - TAB B – Fully Funded Cost Estimate
- Appendix F:** Project Funding Requirements
  - TAB A – Project Cash Flow Curve
  - TAB B – Projected Annual Budget
- Appendix G:** Reporting
  - TAB A – Standard Reporting Formats
- Appendix H:** Resource Allocation Plan
- Appendix I:** Advanced Formulation Plan
- Appendix J:** Engineering and Design Plan
- Appendix K:** Construction Management Plan
- Appendix L:** Real Estate Plan
- Appendix M:** Acquisition Plan
- Appendix N:** Quality Control Plan
  - TAB A – Independent Technical Review Team Membership
  - TAB B – Statement of Technical and Legal Review
- Appendix O:** Permitting Plan
- Appendix P:** Public Involvement Plan
- Appendix Q:** Environmental Plan
- Appendix R:** Value Engineering Plan
- Appendix S:** Water Control Plan
- Appendix T:** Operations and Maintenance Plan
- Appendix U:** Socioeconomics Study Plan
- Appendix V:** Environmental Justice Study Plan
- Appendix W:** Restoration Coordination and Verification Documentation
- Appendix X:** Project Cooperation Agreement
  - TAB A – Example Documents
  - TAB B – Working Project Cooperation Agreement Documents
  - TAB C – Project Cooperation Agreement Checklist
  - TAB D – Executed Project Cooperation Agreement Document
- Appendix Y:** Summary of Work-In-Kind Services
- Appendix Z:** Reference Documents and Forms
  - TAB A – Milestones
  - TAB B – Data Set
  - TAB C – Code of Accounts



## **Appendix AA: Summary of Changes**

### **3.0 Project Management Plan Content**

This section provides guidance on the content for each section of the Project Management Plan. The subsections below correspond with the sections in the Project Management Plan outline provided in Section 2.2.1. For example, Section 3.1 below provides guidance for preparing Section 1.0 of the Project Management Plan and Section 3.1.1 below provides guidance for preparing Section 1.1 of the Project Management Plan.

#### **3.1 Project Information**

##### **3.1.1 Project Description**

This section will provide the project's recommended or authorized title. Also provide a detailed description of the project including location and major geographical landmarks and the individual features that comprise the project. Initially, this will be a description of the project at the Comprehensive Plan level of detail. The initial description may be refined over time as the project scope is refined.

##### **3.1.2 Authority**

This section will cite the applicable Federal and state authorities to design and construct the project. Initially, most projects will only have project study authority and the Federal and state authorities to proceed with pre-construction, engineering and design. Upon the project being authorized for construction, the Project Management Plan should record those authorities at the next available document revision.

##### **3.1.3 Background**

This section will provide any pertinent background information about the project, project area or other relevant data.

##### **3.1.4 Related Projects**

This section will identify those projects, including physical features that may affect or constrain the project's implementation or function.

##### **3.1.5 Differences from the Comprehensive Plan**

Initially this section will explain differences, if any, between the project described in the Project Management Plan and the project as it was described in the Comprehensive Plan. This section will evolve as the project progresses into subsequent project development phases.

## **3.2 Project Scope**

The development of a clearly written scope of work is critical to the development of a viable management plan. The scope should provide a shared vision of the project's implementation and clearly define the project objectives and major deliverables. The scope will provide the basis for future project decisions.

Scope may refer to "product scope," which is the description of the physical portion of the project to be delivered and is measured against requirements, standards and objectives. Scope may also refer to "project scope," which refers to the work that must be performed in order to deliver the products that comprise the project and is measured against the plan of implementation.

The Corps and SFWMD project managers, in coordination with the Project Delivery Team, will clearly define and document both the constraints and assumptions affecting the project. Considering these, the Project Delivery Team will then develop a statement of scope for the project. This statement will provide a description of the following: justification (need), project features (physical project description), deliverables (major products) and objectives (the quantifiable criteria to which the project will be measured, i.e. cost, schedule, and quality measures). Using the statement of scope, the Project Delivery Team will further refine the scope's definition by addressing project constraints, assumptions, historical information on other area projects, and other planning outputs, as applicable.

The Project Delivery Team will develop an initial activity duration estimate for the activities developed during the work breakdown analysis. This initial estimate will be a rough order of magnitude estimate based on the initial manpower requirement assessment and historical information from past projects.

## **3.3 Work Breakdown Structure**

The Work Breakdown Structure is a deliverable-oriented grouping of project elements that organizes and defines the total scope of the project. The Work Breakdown Structure identifies the sub-products that will be required to implement the total project and the hierarchical arrangement of all activities associated with completing each of the required sub-products.

### **3.3.1 Work Breakdown Structure Levels**

The Work Breakdown Structure process is a method commonly used to organize a project in a descending level of detail. As a project is dissected into products and then into sub-products, the broadest or most general level of detail is referred to as Level 2 activities. At this level the activities represent major sub-components, which when put together, comprise the project. As an example, a typical Comprehensive Plan project will have the following major products, or Level 2 activities:

Project Management; Project Implementation Report; Design Documentation Reports; Plans and Specifications; Project Cooperation Agreement; Land Acquisition; Construction; and Operation and Maintenance. For each Level 2 activity, an array of Level 3 tasks support that activity and must be completed to successfully deliver the products and the project. This hierarchy of all activities constitutes the Work Breakdown Structure. The Work Breakdown Structure hierarchy will be reduced to its lowest task level for project scheduling and budget purposes. Products will be broken down in this manner until the products and sub-products are reduced to activities and tasks. Activities are the lowest level of the Work Breakdown Structure that have resources to perform the work. Tasks refer to individual work actions that make up an activity but do not have resources, cost, or duration assigned directly to them. All project activities will be identified (in addition to the agency/action office responsible for completing the product, its schedule, and the budgeted cost) in Appendix B of the Project Management Plan.

### **3.3.2 Activity Duration Estimate**

The Project Delivery Team will develop an initial activity duration estimate for the activities developed during the work breakdown analysis. This initial estimate will be a rough order of magnitude estimate based on the initial manpower requirement assessment and historical information from past projects.

## **3.4 Organization Breakdown Structure**

The Organization Breakdown Structure will specify the agency and action office (e.g. department, division, section, or branch, etc.) responsible for performing each activity in the Project Management Plan. Each office responsible for an activity will be represented by an office symbol or unique designation. A list of these symbols will be included in Appendix C. This section should specifically delineate each agency's role and responsibilities. The division of labor for each major segment of work will be reflected in a table or chart in Appendix C.

## **3.5 Change Control Procedures**

A Project Management Plan is a living document that will be updated or revised, as necessary, throughout the life of the project. Updates are defined as changes to the Project Management Plan that occur on a regular basis and do not substantially modify the schedule, cost, or annual work plan for the project. Updates may result from posting of actual data, corrections to erroneous information, or the addition of new data identified by the project managers. Updates may be made by project managers at any time and presented at each organization's regularly scheduled reporting or status briefing (e.g. SFWMD senior management briefings or Corps Project Review meetings). Project Management Plan revisions are defined as changes that reflect significant changes in the project scope, schedule, cost, and/or annual work plan. Project Management Plan revisions may be scheduled or unscheduled depending on the nature of the change and/or the occurrence of a significant event/milestone or phase of project development. Revisions to the Project Management Plan will require formal approval by the Corps and SFWMD.

The Project Management Plan will serve as the baseline for the identification and tracking of changes in project scope, schedule and cost. Progress will be monitored through the use of performance reports with the goal of identifying changes as soon as possible and forecasting new schedules and/or costs. If changes in scope are identified, the Corps' Engineer Regulation 5-7-11 or other applicable rules and regulations will be utilized as the method to document and seek approval for the change.

### **3.6 Project Schedule Development**

#### **3.6.1 Activity List**

The Project Delivery Team will develop a list of project activities that will be performed with a description of each activity and the initial duration estimate. This list of activities will be the result of the analysis performed during the Work Breakdown Structure development and will be provided in TAB A, Appendix D of the Project Management Plan.

#### **3.6.2 Activity Sequence**

The list of project activities will be sequenced in a logical progression to identify and document the interdependency of activities. It will document mandatory (hard logic), discretionary (preferred logic) and external (relationships to activities outside the project) dependencies.

#### **3.6.3 Logic Network**

The Project Delivery Team will utilize an automated critical path method network analysis system to develop a logic network for the project schedule. The SFWMD and the Corps will utilize common software to the fullest extent possible to ease the data sharing and reporting. The schedule will identify the critical path (the sequence of activities that require the minimum time for the project to complete). A logic network will be developed and include all activities identified during the WBS analysis, the associated dependencies, and other associated activity data. The logic network will be included in Appendix D of the Project Management Plan.

#### **3.6.4 Activity Duration Estimates**

Duration estimates for each activity will be calculated based on estimates of time required to successfully complete each activity. During the estimating process, the Project Delivery Team should consider project constraints and assumptions, resource requirements and capabilities, and available historical information. All assumptions made during the estimating process will be documented in TAB D, Appendix D of the Project Management Plan.

#### **3.6.5 Project Schedule**

A project schedule will be developed for the project using the logic network, duration estimates, constraints and assumptions along with available resource information (time, money, manpower). The project schedule produced will be included with applicable supporting documentation in Appendix D of the Project Management Plan.

### **3.7 Project Cost Estimate**

Cost estimating involves developing a cost estimate for resources needed to complete each project activity. The project cost estimate will be developed using the Work Breakdown Structure, resources available, resource rates, activity duration estimates, historical project information and the existing Corps Financial Management Chart of Accounts. The cost estimate should be a representation of all costs charged to the project expressed in dollars. All cost estimates will be documented in detail and are subject to periodic updates during the project's life. The total project cost summary and the fully funded cost estimate will be provided as TAB A and B, respectively, in Appendix E.

### **3.8 Funding Requirements**

Project budgeting involves allocating the overall cost estimate to individual activities so that project cost performance may be measured. The project budget will be developed using the cost estimates, Work Breakdown Structure and project schedule. The project budget will be included along with applicable documentation, under TAB B, Appendix F of the Project Management Plan.

### **3.9 Functional Area Plans**

For each major functional area, a plan will be developed to provide initial product identification, explain the need for the products and sub-products that will be developed in the functional area, identify inter- and intra-project dependencies, define the rationale for providing these products, and provide written documentation of functional area product development.

#### **3.9.1 Advanced Formulation Plan**

This section will provide the description of all advanced formulation and planning activities necessary to implement the project.

#### **3.9.2 Engineering and Design Plan**

This section will provide the description of all engineering and design efforts necessary to implement the project.

### **3.9.3 Construction Plan**

This section will provide the description of all construction management activities that will be necessary to implement the project.

### **3.9.4 Real Estate Plan**

A Real Estate Plan will be developed at the same time as the Project Implementation Report (or Pilot Project Design Report) but as a separate process. The coordination and timely completion of the Real Estate Plan is critical to the successful execution of a project. The Project Delivery Team will prepare a timeline that details the steps necessary to fully develop the Real Estate Plan for the project. This timeline will be included as Appendix L of the Project Management Plan and will, at a minimum, define the steps required, milestone activities and cost necessary to complete the Real Estate Plan. The team will ensure that all milestone activities and costs identified during this planning process are included in the appropriate places in the project's schedule and budget.

Each project's Real Estate Plan will address the project's real estate needs, a baseline cost estimate, land acquisition milestones and other pertinent real estate information. The baseline cost estimate for real estate includes a gross appraisal, which must be reviewed and approved according to current delegated authority. Refer to Engineer Regulation 405-1-12, Chapter 12 and Paragraph 2.4 of the Master Plan for further guidance on content for the Real Estate Plan.

### **3.9.5 Contracting and Acquisition Plan**

This section will describe the acquisition plan including a list of the contracts that are anticipated to need acquisition plans. The purpose of the acquisition plan is to ensure that the Corps and the SFWMD meets their needs in the most effective, economical, and timely manner. A team consisting of those who will be responsible for significant aspects of the acquisition (i.e., contracting, fiscal, legal, and technical personnel) will be formed to develop the acquisition plan. The Competition in Contracting Act, as implemented in the Federal Acquisition Regulations Part 7, requires agencies to perform acquisition planning and conduct market surveys in order to promote and provide for full and open competition.

### **3.9.6 Quality Control**

Product quality is the responsibility of the Project Delivery Team. Execution of design and technical quality is the responsibility of technical staff. Technical quality must be achieved while conforming to schedules and budgets. To ensure that these goals are met simultaneously, it is essential that coordinating and planning the work effort occur at the earliest stage of the project development, through preparation and execution of the management plan. The technical staff must provide input for development of the plan. The technical staff in conjunction with the Project Delivery Team, staff must ensure that the work is properly defined and schedules are attainable.

#### **3.9.6.1 Quality Control Plan**

Each Project Management Plan will have a Quality Control Plan. As a minimum, each Quality Control Plan will include the following:

- Project Synopsis: Describe the project in sufficient detail so readers will have a clear understanding of the scope.
- Production: List the Project Delivery Team leader and members with their specialties, including office symbols and telephone numbers.
- Independent Technical Review: List review team leaders and members with their specialties, including agency and office symbols, telephone numbers and e-mail addresses.
- Schedule: Include a schedule of engineering events, site visits, and key intermediate milestones for development of the overall product. Include the Independent Technical Review Team at appropriate milestones within this schedule. The schedule should be updated periodically to reflect changes and current status and be readily available to the team.
- Architect-Engineer Contracted Products. If a significant portion of the project is to be completed by an Architect-Engineering firm, then include the following:
  - Architect-Engineer's Quality Management Plan
  - Architect-Engineer's Organization Chart (with names and positions identified)
  - List of Architect-Engineer's Project Delivery Team and their agency counterparts
  - List of Architect-Engineer's Independent Review Team members

The Quality Control Plan should be updated when significant changes occur on the project.

### **3.9.6.2 Independent Technical Review**

Throughout the life of each project, quality assurance will be maintained through periodic independent technical review. Each project will have an Independent Technical Review Team assigned to conduct reviews. The Independent Technical Review Team shall be established concurrently with the Project Delivery Team. The Independent Technical Review Team will conduct reviews, as necessary, to ensure that products are consistent with established criteria, guidance, procedures and policy. The members of the team will be completely independent of the project being reviewed and should be fully familiar with the design criteria established for the program. The Independent Technical Review Team may be comprised of Corps, SFWMD or contract personnel. The review process will be continuous with reviews coordinated by the Corps and SFWMD project managers to minimize lost design effort. This review process will be integrated into the project schedule and closely tracked by the project managers to ensure timely completion of the reviews. The Independent Review Team will use standard guidelines established by the SFWMD and the Corps.

The Independent Technical Review Team will furnish the Project Delivery Team with reports at critical points during project formulation, design, and construction to document its actions and recommendations.

A Statement of Technical and Legal Review will be completed for all final products and final documents. In the case of decision documents forwarded to the Florida Department of Environmental Protection and Corps' Headquarters for review, a Statement of Technical and Legal Review should accompany both draft and final documents. A sample Statement of Technical and Legal Review will be included as TAB B, Appendix N of this plan.

### **3.9.7 Permitting Plan**

The Project Delivery Team will develop a list of permits and their requirements for each project. The tasks, time, cost, agency responsibility, and resource requirements for each permit will be identified and scheduled by the team. This analysis (the permitting plan) will be included, in detail, in the Project Management Plan as Appendix T. The permitting plan will include adequate time for pre-application coordination with the permitting agencies and for all elements of the permitting process, such as public notices of permit applications, technical reviews of permit applications and supporting documents, preparation and review of draft permits, and public notice of permitting agency actions. The key milestone activities associated with each permit will be captured in the project's schedule.

### **3.9.8 Public Outreach and Involvement Plan**

Each project within the Comprehensive Plan will have a public outreach and involvement plan that will serve as the guideline for executing the public outreach and public involvement tasks necessary for that project. The Project Delivery Team, during Project Management Plan development, will identify public involvement tasks necessary to provide information to and solicit information from the public on project activities and to provide feedback to the public. The Project Delivery Team will develop time, cost and resource estimates for the tasks identified in the public involvement plan. The public outreach and involvement plan will include, but not be limited to, the following:

- Public Information and Input
- Internal Audiences (Stakeholders)
- Media
- Outreach Activities
- Partnering

The Project Delivery Team will also closely coordinate the plan development efforts with those of the team developing the programmatic public outreach management plan for the Comprehensive Plan. The team must also look for opportunities outside the immediate project to promote the benefits that the project provides to the total restoration of the ecosystem. Each individual project plan must capture the essence of the objectives of the programmatic public outreach management plan as follows:

- Keep the public informed
- Provide for public participation in the development of the project
- Target specific stakeholder groups or affected public for support.



The public outreach and involvement plan and the associated time, cost and resource estimates will be included in Appendix P of the Project Management Plan.

Given that a typical Project Management Plan will be updated periodically as a project moves through its life cycle, the level of detail and focus of the public involvement plan is subject to change. The plan will initially focus on the Project Implementation Report (or Pilot Project Design Report), then later shift to the engineering and construction and, finally, to the project's monitoring results and contribution to the restoration of the ecosystem as well as other project purposes.

### **3.9.9 Environmental Compliance**

This section will describe the project environmental requirements with respect to the National Environmental Policy Act and other Federal and state laws and how these will be met. Since this project is being considered based primarily upon potential environmental benefits, environmental considerations are extremely important. This section will also address the anticipated environmental impacts of the project, and describe the environmental monitoring that is planned for the periods before, during and after construction.

### **3.9.10 Value Engineering Plan**

This section will describe the project value engineering requirements and how these requirements will be addressed during the project. For civil works projects costing more than \$10 million, Engineer Circular 1110-2-8159 requires that a cost effectiveness review be accomplished under the direction of the Value Engineering Officer using value engineering methodology. A signed Certificate of Cost Effectiveness is required. Such a review will be conducted prior to completion of the plans and specifications. Engineer Regulation 1110-1-12 requires a value engineering study for all projects with an estimated construction cost of \$2.0 million or more.

### **3.9.11 Water Control Plans**

This section will describe all activities needed to develop the various water control plans and provide the water management rationale involved with the implementation and operation of the project's features.

### **3.9.12 Operation and Maintenance Plan**

This section will discuss the development of an operation and maintenance plan for the project. This will include the development of an Operation, Maintenance, Repair, and Rehabilitation Manuals. As the project is constructed, interim manuals will be prepared jointly by the Corps and the SFWMD. Upon completion of project construction and an operational testing and monitoring phase, a final manual will be assembled and provided to the SFWMD.

### **3.9.13 Socioeconomics Study Plan**

This section will provide the description of all socioeconomic efforts required to implement the project, including the relationship to program-level efforts.

#### **3.9.14 Environmental Justice Study Plan**

This section will provide the description of all activities to address environmental justice issues and concerns at the project level. This section also will discuss the relationship of the project-level environmental justice activities to those planned for the overall program.

#### **3.10 Restoration Coordination and Verification (RECOVER) Integration**

This section will describe the project's integration with the RECOVER team's efforts. Throughout the project development process, requirements for the exchange of data will require frequent interaction between the RECOVER teams and the Project Delivery Team. Documentation of this coordination will be included in Appendix X.

#### **3.11 Project Cooperation Agreement**

During the development of a Project Implementation Report (or Pilot Project Design Report), the Corps and the SFWMD will develop a draft Project Cooperation Agreement. Upon finalizing the Project Implementation Report, which will be forwarded as the project decision document for Congressional authorization (Pilot Project Design Reports will not be submitted to Congress), a draft Project Cooperation Agreement package will be prepared. In accordance with Engineer Regulation 1105-2-100, this package will consist of a draft Project Cooperation Agreement, a statement of financial capability (an assessment of SFWMD's ability to fund its share of the project costs), and a letter of support from the SFWMD. Project managers assigned to the Corps Jacksonville District's Programs and Project Management Division will compile and coordinate review of the draft Project Cooperation Agreement package. The draft Project Cooperation Agreement package will be submitted to the Corps South Atlantic Division, Corps Headquarters and the Assistant Secretary of the Army for Civil Works. The final Project Cooperation Agreement will then be returned to the Jacksonville District for signing by the SFWMD. The signed Project Cooperation Agreement will be transmitted to the Assistant Secretary of the Army for Civil Works for final signatures. Examples of a draft PCA package will be included in Appendix X of the Project Management Plan. The model Project Cooperation Agreement can be downloaded from the Corps official website at: [www.hq.usace.army.mil/cecc/6008.pdf](http://www.hq.usace.army.mil/cecc/6008.pdf)

The Corps' Project Cooperation Agreement Checklist can be found at:  
[www.usace.army.mil/inet/functions/cw/cecwa/branches/review/pdf/pcachk.pdf](http://www.usace.army.mil/inet/functions/cw/cecwa/branches/review/pdf/pcachk.pdf)

The Corps' Project Cooperation Agreement guidance can be found at:  
[www.usace.army.mil/inet/functions/cw/cecwa/branches/review/pcaguide.htm](http://www.usace.army.mil/inet/functions/cw/cecwa/branches/review/pcaguide.htm)

#### **3.12 Project Closeout Procedures**

This section will provide guidance on closing out the project. This will include final project closeout activities, but will also address closeout of architect-engineer and construction contracts, product development efforts, and other efforts performed to implement the project. Final project closeout will include activities such as transfer of real property to the SFWMD, final audits, financial accounts balancing, and notice of project completion. The initial Project Management Plan will provide a general discussion of the closeout procedures, with the detailed discussions included in the pre-construction phase revision.

### **3.13 List of Project Management Plan Preparers**

This section will list the individuals that contributed in the development of the Project Management Plan and include their agency and organizational element.

### **3.14 Summary of Work-In-Kind Services**

This section will provide a description of work-in-kind services to be performed by the SFWMD.

### **3.15 Reference Documents**

This section will list references for use in the Project Management Plan. Frequently referenced documents and forms will be included in Appendix Z of the Project Management Plan.

### **3.16 Summary of Changes**

This section will contain the changes to the Project Management Plan listed chronologically.

## **4.0 Project Management Plan Reference Documents**

- Code of Accounts (TBD)
- Milestones (TBD)
- Work Breakdown Codes (TBD)

**APPENDIX C**  
**DESCRIPTION OF FORMAT AND CONTENT**  
**FOR**  
**PILOT PROJECT DESIGN REPORTS**

## **1.0 General Introduction to Pilot Project Design Reports**

This appendix provides guidance on the development of a Pilot Project Design Report. It contains general guidance and recommendations on the development process, format and content for a Pilot Project Design Report. The guidance contained in this appendix is intended to be general in nature as it is expected that each project within the Comprehensive Plan will have unique requirements that will be addressed as necessary in the appropriate part of an individual report.

Appendix C is divided into sections that correspond with the sections of the Pilot Project Design Report. Within each section of the appendix, a narrative describing the format and content pertaining to the subject of the section is presented.

A Pilot Project Design Report will be developed for each pilot project implemented under the Comprehensive Plan. It will serve as both a decision document as well as a means to fully develop technical information needed for further implementation (plans and specifications development, construction, monitoring and assessment). The Pilot Project Design Report will contain some aspects of a Project Implementation Report (see Master Plan Section 4.3) and all of the elements of a Design Documentation Report (see Master Plan Section 4.4). It will include engineering and design products such as surveys and mapping, geotechnical investigations, site analyses, design optimization, construction cost estimates, economic analyses (if relevant), environmental analyses, real estate analyses and supplemental National Environmental Policy Act (NEPA) documents. The report will also include a fully developed, detailed monitoring and testing plan. The monitoring and testing plan will describe the procedures for the investigations necessary to address the uncertainties and the technical feasibility of full-scale implementation of the feature. Work associated with the development of this report will be conducted by a multidisciplinary interagency team. There will be opportunities for public involvement at critical points during the report's development.

The Pilot Project Design Report will identify the means by which the technical concerns/issues identified will be resolved by the pilot project. As a component of the report, the monitoring and testing plan will, at a minimum, include field data collection and technical investigations to resolve technical issues. The report will include investigations needed to support the engineering design, regulatory permits, construction techniques, construction and operational monitoring plan as well as operations of the pilot project. The report will also provide a detailed breakdown of the proposed costs, timelines and agency responsibilities for implementing the pilot project.

## 2.0 Guidelines for the Pilot Project Design Report

The complete design analysis and the Pilot Project Design Report will be maintained in the SFWMD and Corps official files. It may be produced in the form of a bound hard copy or any permanent electronic media such as CD-ROMs, in accordance with this appendix and the following guidelines:

- **Syllabus** - A summary of project data applicable to the feature being presented will be included
- **Table of Contents** - To facilitate references and review, each Pilot Project Design Report will have a table of contents, which identifies major sections, appendices and graphical information. It will include all major section numbers, section titles, page numbers and a list of graphical information.
- **Text** - All text sections will be numbered or lettered.
- **Graphical Information** - Graphical information will be appropriate for binding and filing.
- **Calculations** - Calculations and summaries of analysis results will be presented in appendices, in a form that is readable and understandable for the reviewer. The calculations should be summarized, if necessary, to clarify analysis methods for the reviewer and to remove unnecessary pages, such as repetitive trials and errors. Calculations will always include page numbers and will be preceded by a detailed table of contents.

## 3.0 Content of Report

The Pilot Project Design Report will contain a full record of advanced formulation and design decisions, that have been made and all methods and analyses used subsequent to the April 1999 Comprehensive Everglades Restoration Plan. It will be sufficiently clear so that an engineer or individual not familiar with the project could review the Pilot Project Design Report and understand how the project evolved into its final configuration, and why each key decision was made. It will be sufficiently detailed, for each technical specialty, so that the criteria which were used, the critical assumptions which were made, and the analytical methods which were used will be evident for purposes of review and historical documentation. The report will also contain summaries of important calculation results and selected example calculations for all critical elements of the design.

### 3.1 Project Description

A general description of the entire project as set forth in the Comprehensive Plan will be included as well as any differences in the feature being presented with the Comprehensive Plan and why these changes do not require a post-authorization change.

### **3.2 Pertinent Data**

A tabular summary of essential data on the project construction cost, physical features, project purpose and controlling elevations (e.g., for design flood, real estate acquisition and relocations, etc.) will be included.

### **3.3 References**

Basic data and criteria used in the design, referring to applicable engineering manuals and regulations, guide specifications and other sources of criteria will be listed. Include any criteria waiver approvals.

### **3.4 Pilot Project Formulation**

Formulation efforts will be conducted to evaluate alternative plans, both structural and non-structural, for economic, environmental and engineering effectiveness based on the pilot project's objectives and constraints. Formulation activities will include the selection of site suitability criteria followed by an iterative facility siting analysis also based upon this criterion. Additional formulation and evaluation of alternative plans will be of sufficient scope to recommend a plan determined to be the most feasible and cost-effective means of meeting the stated objectives within the identified framework. In some regards, the Pilot Project Design Reports are similar to a Project Implementation Report; however, the formulation sections will be abbreviated with emphasis placed on the design which will be at a higher level of detail.

The April 1999 Feasibility Report contains a Programmatic Environmental Impact Statement which addresses at a general level, the alternatives and environmental effects of the overall project to the affected environment. Due to the conceptual nature of the Comprehensive Plan and the associated uncertainties, a site-specific environmental document will be required for the pilot project. This will include the work necessary to develop either an Environmental Assessment, resulting in a Finding of no Significant Impact, or an Environmental Impact Statement. These documents may accompany the Pilot Project Design Report.

The Pilot Project Design Report formulation will also include:

**Problems and Opportunities** – Discussion should include the following, as appropriate:

- Public Concerns
- Ecological Problems and Opportunities
- Water Quality Problems and Opportunities
- Economic and Social Well-Being Problems and Opportunities
- Pilot Project Goals and Objectives

**Plan Formulation and Evaluation** – Discussion should describe the following:

- Plan Formulation and Evaluation Methodology
- Array of Alternative Plans
- Cost effectiveness analysis with incremental analysis, where applicable
- Evaluation
- Plan Selection
- Rationale
- Description of Plan

**Environmental Effects** – Discussion should include an assessment of environmental effects of the project.

**Plan of Implementation** – Discussion should include a description of the following:

- Construction
- Operation
- Real Estate
- Monitoring
- Cost Estimate
- Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R)
- Cost Sharing

**Public Involvement and Coordination** – Discussion should address the following:

- Public Involvement Program
- Stakeholder Involvement and Outreach
- Review Conferences
- Public Meetings

**Compliance with Environmental Requirements** – Discussion should address compliance with environmental requirements that are applicable to the project.

**Recommendations** – Discussion should include a summary of specific recommendations for construction, operation, testing and monitoring the pilot project. This section should include a narrative, and if applicable, plates displaying the recommended pilot project plan.

**Annexes** – The report will include applicable documents such as the following:

- Fish and Wildlife Coordination Act Report
- Biological Opinion
- Environmental Considerations
  - Section 404(b)(1) Evaluation

- Soils
- Geology
- Climate
- Air Quality
- Vegetation
- Short-Term Uses and Long-Term Productivity Relationship
- Fish and Wildlife
- Threatened and Endangered Species
- Water Management
- Water Quality
- Water Supply
- Irreversible and Irrecoverable Commitments of Resources
- Socioeconomics
- Recreation Resources
- Aesthetic Resources
- Cultural Resources
- Hazardous, Toxic, and Radioactive Wastes
- Land Use
- Unavoidable Adverse Environmental Effects
- Noise
- Cumulative Effects
- Environmental Requirements
  - National Environmental Policy Act of 1969
  - Fish and Wildlife Coordination Act of 1958
  - Coordination Act Report
  - Endangered Species Act of 1973
  - National Historic Preservation Act of 1966
  - Clean Water Act of 1972
  - Clean Air Act of 1972
  - Coastal Zone Management Act of 1972
  - Farmland Protection Policy Act of 1981
  - Wild and Scenic River Act of 1968
  - Estuary Protection Act of 1968
  - Federal Water Project Recreation Act of 1965
  - Resource Conservation and Recovery Act of 1976
  - Toxic Substances Control Act of 1976
  - Marine Protection, Research and Sanctuaries Act of 1972
  - Rivers and Harbors Appropriation Act of 1899
  - Coastal Barrier Resources Act
  - Section 904 of the 1986 Water Resources Development Act
  - Section 307 of the 1990 Water Resources Development Act
  - Executive Order 11988, Floodplain Management
  - Executive Order 11990, Protection of Wetlands



- Executive Order 12114, Environmental Effects Abroad of Major Federal Actions
- Executive Order 12898, Environmental Justice

### **3.5 Engineering Studies, Investigations and Design**

The Pilot Project Design Report will include as a discussion of the results from all investigations, analyses and calculations made for the design. For each technical specialty, include clear definitions of all criteria, analysis methods and assumptions. The results will contain the description and information necessary to perform independent review. Such information will include, as applicable, the following:

- Determination of final location and resulting site plan for specific features
- Refinements to project hydrology for specific features
- Determination of pertinent hydraulic design features, flow characteristics and discharge capacities, but not detailed design computations, except in unusual or unprecedented cases when such computations will facilitate review. Sufficient detailed design will be included for the Independent Technical Review Team and for the plans and specifications of critical spillways as well as other water control structures and refinements in levee alignments
- Design of water surface profiles, discharge coefficients and curves as well as other plotted data or tabulations
- Stability safety factors, applied loads, load factors and material strengths will be listed along with comparisons between calculated values and criteria requirements. Typical calculations will be included for selected critical elements. Summaries of results will be provided for remaining elements. Analyses will document the final structural design for the project, except for detailing requirements
- Results of geotechnical investigations
- Determination of adequacy and use of materials, strengths, stability, slopes and protection of critical sections of embankments and foundations. Examples of calculations for slope stability, consolidation, settlement, bearing capacity and seepage analyses will be included
- Determination of source, adequacy and use of construction materials, or appropriate references to previously prepared documents on the subject.
- Determination of the most effective water control plan, including but not limited to dewatering and pressure relief and order of work, which will result in the least property

damage, construction delays or possibility of failures. The level of flood protection and risk during construction will also be addressed.

- Design computations to determine the size, strength, rating, adequacy and interrelationships of electrical and mechanical items, but not design computations to develop details, except in unusual cases where such details are critical. A description of the operation and maintenance requirements will also be included. Refined quantities and cost estimates including operation and maintenance cost data will be presented.
- Results of investigations and analyses that lead to required relocations
- Determination of the water quality characteristics of a proposed impoundment and the ability of the project's outlet works and regulation scheme to meet downstream water objectives
- Design of disposal areas for cleared and excavated material including access, grading, erosion and sediment control
- Summary of hazardous, toxic and radioactive waste considerations related to worker health and safety and disposal requirements
- Discussion of hazardous, toxic and radioactive waste remedial and other actions required prior to construction and allowable hazardous, toxic and radioactive waste levels at the start of construction. Also, include a summary of any hazardous, toxic and radioactive waste investigations, regulatory compliance issues and remedial activity.
- Copies of correspondence of manufacturer's concerns will be presented in the design. Also, when no additional environmental documentation is required, copies of correspondence documenting additional coordination with state natural and cultural resource agencies since completion of the Comprehensive Plan.
- Operation and maintenance requirements that will need to be addressed in the Operation & Maintenance Manual.
- Description of the facilities designed to accommodate the physically handicapped.
- Results of water analysis and soil testing to determine the need for corrosion mitigation. The water analysis will include resistivity and pH at the site. If it appears that extensive corrosion mitigation will be required, complete information on the results of surveys and tests to determine the corrosion characteristics of the water and soil at the site, the conclusions reached and the solution will be presented. The solution for the various components will be presented in detail, listing the materials and/or methods proposed for use.
- A summary of all environmental engineering factors and considerations that have been incorporated into the project as established in the authorizing document. This includes a

discussion of the environmental impact of proposed project features and measures proposed to mitigate any environmental damage or to enhance the environment. A brief discussion will specify changes, if any, which will need to be reflected in the National Environmental Policy Act document. Explain how the views of natural and cultural resource agencies were incorporated into project design or construction.

- A reference to all value-engineering studies that have been prepared for the current design, including a summary of significant value-engineering proposals incorporated.

### **3.6 Graphical Information**

Design drawings, sketches, charts, diagrams, maps, profiles or other graphical information necessary to clearly illustrate the design will be included or referenced in the contract plans. The maps will clearly identify all places mentioned in the text of the Pilot Project Design Reports.

### **3.7 Cost Estimates**

Cost estimates will be based on quantities and unit prices, historical data or cost models, depending on the level of design information available. The method selected must be equivalent and establish reasonable supportable costs for comparison of alternate designs.

### **3.8 Technical Review Documentation**

Reviews completed by the Project Delivery Team and the Independent Technical Review Team will be documented in the Pilot Project Design Report. The report will include documentation of in-progress reviews at key decision points in the design process, resolutions and agreements that were reached in technical review conferences and annotated comments that surfaced during the independent technical review process. Technical review documentation will be included as an appendix in the Pilot Project Design Report. In addition, a copy of the Statement of Technical and Legal Review for the design and plans and specifications process will be included in the report. The documentation from the Independent Technical Review Team required by the Quality Control Plan may be either included or referenced.

### **3.9 Project Delivery Team**

Document the Project Delivery Team members and preparers of the report, including their agency and their organizational element.

**APPENDIX D**

**DESCRIPTION OF FORMAT AND CONTENT  
FOR  
PROJECT IMPLEMENTATION REPORTS**

**Major Project Implementation Report Tasks**

**1.0 Plan Formulation**

Additional formulation studies will be conducted to evaluate alternative plans, both structural and non-structural, for economic, environmental and engineering effectiveness based on study objectives and constraints. Formulation activities will include the selection of site suitability criteria followed by an iterative facility siting analysis based upon the site suitability criteria. Additional formulation and evaluation of alternative plans will be of sufficient scope to recommend the authorization of a plan determined to be the most feasible and cost-effective means of meeting the stated study objectives within the identified planning framework.

Alternatives will be developed and evaluated to meet the planning goals and objectives identified for the Project Implementation Report study. The following process will be used to identify a recommended plan that is economically feasible and implementable from an engineering, economic and environmental standpoint.

**Problem Identification** - The Corps, SFWMD and other participating Project Delivery Team members will review the problems and opportunities identified in the April 1999 Final Feasibility Report and determine if additional problems exist to be identified in the Project Implementation Report study. Scoping efforts, performed early in this phase by the Corps and SFWMD, will ensure that public concerns related to these problems are identified and addressed during the study. Planning goals, objectives and constraints will then be developed by the Project Delivery Team.

**Initial Plan Formulation** – Alternate plans will be formulated to identify specific ways to achieve planning objectives, within constraints, to solve problems and realize opportunities. This task will include public workshops in which ideas to meet the study objectives will be presented. Alternative plans will address environmental, urban and agricultural water supply needs; wetlands preservation and enhancements and water quality treatment requirements, as appropriate.

**Initial Screening** - This effort in the Project Implementation Report study will involve a qualitative assessment of the plan components and alternative combinations of those components. The preliminary assessment of each alternative plan will involve the measurement or estimation of the effects of each alternative plan and determination of the difference between without-plan and with-plan conditions for each of the planning objectives. The process will also include assigning economic and social values to the plans, using technical information gathered for comparison of plan alternatives. The plans will be

screened to identify the most viable components for a detailed study through qualitative analysis and public workshops. This process will ensure that the plans to be evaluated are consistent with agency and local interests regarding water resource issues and natural system needs such as wetlands and wildlife conservation, threatened and endangered species, economic development, comprehensive land planning, appropriate water quality standards, maintenance of water supplies, flood protection and sustainable agriculture. Through this qualitative analysis, the plans will be screened to identify the most viable components for more detailed study.

**Select Final Array of Alternatives** - Following completion of the initial screening, the plan alternatives to be considered in the detailed evaluation will be selected as the study progresses.

**Final Screening** - Modeling will be required for detailed design and environmental output evaluation purposes. Hydrologic and hydraulic model development, environmental model development and water quality and water supply analysis will be required to refine plan formulation and evaluation. The evaluation of the final set of alternative plans will consist of analyzing the effects of the plans against various sets of evaluation categories and criteria to determine effectiveness in meeting the planning objectives. This analysis will consider the requirements outlined in Chapter 373.1501 Florida Statutes and any applicable state and federal legislation (e.g., future Water Resource Development Acts). The results of these evaluations will be compared to identify significant differences among the plans.

**Risk and Uncertainty Analysis** - Risk and uncertainty are inherent in water resources planning and design. They arise from the innate variability of complex physical, biological, social and economic situations. This is particularly true for the evolving nature of environmental restoration. Risk and uncertainty factors will be considered as they relate to the evaluation of alternative plans. Appropriate techniques will be applied to evaluate risk and uncertainty for this plan.

**Optimization of the Recommended Plan** - Cost effectiveness and incremental cost analyses will be used to compare different outputs resulting from various levels of expenditures. This effort will include development of an implementation process that incorporates an adaptive assessment strategy for project implementation. This strategy will recognize that once restoration measures are implemented and monitoring begins, feedback is provided based on new insights gained from the response of the ecosystem and that sequential adjustments may be made to the project and future elements.

## **2.0 National Environmental Policy Act Documentation**

The April 1999 Feasibility Report contains a Programmatic Environmental Impact Statement, which addresses at a general level, the alternatives and environmental effects of the overall project to the affected environment. Due to the conceptual nature of the Comprehensive Plan

and the associated uncertainties, many subsequent site-specific environmental documents will be required for the project components. This task will include the work necessary to develop either an Environmental Assessment, resulting in a Finding of no Significant Impact, or an Environmental Impact Statement. These documents may be integrated with the Project Implementation Report.

An evaluation methodology will be developed to predict environmental outputs and to support a comparison of environmental benefits of the different alternative plans. Impact assessment will be required in order to determine the anticipated effects of plans on cultural and biological resources within the study area. A series of meetings with agency personnel, scientists and others will be conducted to identify the merits of specific impact assessment techniques, to determine when specific impact assessment techniques will be available and ultimately to select an impact assessment method to be used.

## **2.1 Impact Assessment**

This task includes environmental data collection and evaluation of the environmental character of the project area. In general, project alternatives will consist of several components to be evaluated individually and in combination; however, specific planning and evaluation activities for land suitability, water supply and yield identification and environmental assessments will be conducted. Studies will be performed cooperatively with the U.S. Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, Everglades National Park, National Oceanic and Atmospheric Administration, Florida Department of Environmental Protection and other resource agencies, as appropriate.

These studies will be completed in accordance with the National Environmental Policy Act of 1969, as amended (91-190) and the Council on Environmental Quality National Environmental Policy Act regulations (40 CFR Parts 1500 - 1508). The National Environmental Policy Act document will follow the format described in Engineering Regulation 200-2-2.

Formal coordination with the state will occur at several points during the study to ensure consistency with state programs, including the State Coastal Zone Management Act. It is anticipated that coordination will be accomplished by scoping and follow-up letters and subsequent meetings to ensure state participation in the study process, plan development and evaluation. Coordination with the state under the Clean Water Act will be required if material is placed within a wetland or waters of the United States. The Clean Water Act requires two actions, a 404(b)(1) evaluation and state water quality certification. The 404(b)(1) evaluation is a determination of the impacts of a proposed action on water quality and biological resources and will be included as an appendix to the Project Implementation Report. Although the Project Implementation Report will meet the requirements of section 404(r) of the Clean Water Act (Public Law 92-500, as amended), a Section 401 state water quality certificate will be requested.

The following are activities that may be required to conduct an impact assessment as required by the National Environmental Policy Act.

**Initiate Scoping** – Initiate the necessary coordination with Federal, state and local agencies and the public, including coordination needed for compliance with the National Environmental Policy Act.

**Biological and Field Investigations** - A literature search of environmental resources of the area will be conducted. Site information will also be obtained through use of the National Wetland Inventory, Geographic Information System and available aerial photography. Field investigations of each project site will include an inventory of habitats and species occurrence to determine existing conditions. All work will be accomplished in cooperation with the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission in conjunction with field work to be performed by the U.S. Fish and Wildlife Service for the Fish and Wildlife Coordination Act Report.

**Select Impact Assessment Method** - This effort involves meeting with the local sponsor, U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission to determine the impact assessment method to be used to evaluate specific environmental responses to project alternatives in the Fish and Wildlife Coordination Act Report. A meeting will also be held with appropriate regulators to determine methods to be used for evaluating regulated actions.

**Initial Assessment** - Project sites and impacts will be evaluated according to the impact assessment method. All work will be performed cooperatively with the U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission.

**Input for Screening Alternatives** - An analysis to reduce project impacts will be conducted with the U.S. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission and will feed back into project design.

**Cultural Resource Studies** - An evaluation of the impacts of the alternative plans upon historical, architectural and archaeological resources are required. It is anticipated that various historic resources may be present within the study area, including National Register of Historic Places (National Register) sites, middens and possibly burial sites. All studies will be coordinated with the State Historic Preservation Office in accordance with the National Historic Preservation Act, as amended (PL 89-665) and the Archeological and Historic Preservation Act, as amended (PL93-291). Cultural resources studies will begin with an intense literature survey of both the resources and previous coordination of these studies with the State Historic Preservation Office. Such sites will be avoided whenever possible. If that is not possible, a mitigation plan will be developed in consultation with the State Historic Preservation Office. Documentation will be submitted for review to the State Historic Preservation Office. An assessment of the impacts of the proposed project upon cultural resources will be prepared as part of the National Environmental Policy Act analysis.

**Biological Assessment** - This work will include a review of information on species listed as threatened or endangered that may exist in the study area. A Biological Assessment will be prepared to address potential impacts to threatened and endangered species. Based on the

information provided in the Biological Assessment, a determination will be made as to whether the proposed action may affect any listed species. If any listed species may be affected, then consultation with the U.S. Fish and Wildlife Service will be initiated and a Biological Opinion will be requested of the U.S. Fish and Wildlife Service. No funds are provided to the U.S. Fish and Wildlife Service for completion of a Biological Opinion.

**Coastal Zone Management Evaluation** - Technical information needed will be obtained and a Coastal Zone Management Act evaluation, including a determination of consistency in the Environmental Impact Statement, will be completed.

**Water Quality Certification Pre-Application Coordination** - Close coordination with the state will be required throughout the study process. Water quality certification will be requested after the study phase, when sufficient engineering detail is available for the specific project.

**404(b)(1) Evaluation** - Excavation and fill volumes from engineering designs will be obtained and a 404(b)(1) evaluation will be completed and included in the Project Implementation Report.

**Aesthetic and Recreation Resource Analysis** - An aesthetic and recreation resource analysis will be completed and will include a discussion of existing conditions, a comparative resources analysis of the impacts of study alternatives and the selected plan as well as a delineation of any mitigative design measures, if needed.

**Additional Environmental Sampling** - Following the Technical Review Conference, additional environmental sampling will be conducted and incorporated into the impact assessment analysis.

**Input for Final Alternatives** - Additional beneficial environmental features will be identified and included in the final project design.

**Draft Record of Decision** - A Draft Record of Decision will be prepared to document the final decision on a proposed action requiring a Supplemental Environmental Impact Statement as required by Section 105.2 of the National Environmental Policy Act, the Environmental Quality Improvement Act of 1970 as amended, Engineering Regulation 200-2-2, and ER 1165-2-1. The Draft Record of Decision will identify, in a logical manner for the public, the factors which led to the conclusions and recommendations presented in the Final Supplemental Environmental Impact Statement. The Draft Record of Decision will identify alternatives considered; designate the environmentally preferred alternative or alternatives; the relevant factors including economic and technical considerations, statutory missions, and national policy which were balanced to make the decision; and whether all practicable means to avoid and minimize environmental impacts have been adopted, and if not, why not.

### **3.0 Economics**



This will not be a traditional National Economic Development benefit-cost analysis effort, since the environmental benefits will not be expressed in monetary terms. As a result, a National Economic Development Benefit/Cost ratio, which normally indicates economic justification, will not be calculated.

More detailed design, cost, hydrological and environmental effect analysis results will be developed for each Project Implementation Report than those performed during the Comprehensive Review Study. This will enable a more detailed evaluation of pertinent economic impact issues to be completed. Even though more detail will be available, some impact issues will receive limited analysis due to the regional nature of the impacts. For example, water supply impacts must be viewed in a regional context in order to assess impacts. While more detail is to be developed for each Project Implementation Report, measuring the water supply system's regional performance can only be performed on a limited basis, if only one component of the regional system is being assessed, which will be the case for each Project Implementation Report. Nevertheless, each of the benefit and cost impact areas, outlined in more detail below, will be addressed for each Project Implementation Report to determine the appropriate level of analysis given the following: the nature of the component impacts; available design and cost data; and the extent of hydrological and other pertinent data.

### **3.1 National Economic Development Costs and Benefits**

This work includes an estimation of project economic benefits and changes in project services. Areas that may be impacted include flood damage reduction benefits for both Native American tribal lands and other areas, effects on agricultural and non-agricultural sectors resulting from changes in water supply, commercial fishing, recreation, navigation and other costs and benefits.

**Flood Damage Studies** - Flood damage analysis will address the impact of project alternatives on flooding. The analysis will be based on hydraulics and hydrology information (frequency, stage, duration and area), to the extent it will indicate whether flood damages would be greater or less with an alternative than in the without-project condition. Both urban and agricultural damages will be addressed as necessary, using appropriate depth-damage relationships for urban and duration-damage relationships for agriculture.

**Water Supply Studies** – Water supply impacts will be addressed as appropriate for each Project Implementation Report. Because the water supply system is a regional system, system-wide impact analysis is relevant, but not meaningful on a component by component basis. This issue will require an ongoing assessment of any significant deviations from Comprehensive Plan regional performance evidenced by individual component design and performance.

**Commercial Fishing Studies** – Potential impacts on commercial fishing were addressed in the Comprehensive Plan. Detailed impacts require a more thorough knowledge and understanding of specific hydrologic-ecological-economic linkages than is known. Much of the potential for commercial fishing impacts is constrained by Fishery Management

Plans and related policy. Nevertheless, this issue will be revisited for each Project Implementation Report.

**Recreation and Navigation Studies** – Project-related recreation activity currently taking place in the region is addressed in the Comprehensive Plan. Opportunities for improved quality of recreational experience and increases in the quantity of annual visitation to system resources will likely result from the implementation of the Comprehensive Plan. Economic analysis will be a part of such planning. It is possible that detailed recreation facility plans (visitor centers, access, etc.) will be a part of some efforts. Navigation impacts, both recreational and commercial, are potential impacts of project implementation. This issue is to be addressed, as appropriate, for those components expected to impact navigation.

**Costs Analysis** - An important aspect of ecosystem restoration project planning is to properly articulate the cost impacts of each alternative. Economic evaluation technical support will be required in this area.

### **3.2 Regional Impacts**

The Regional Economic Development evaluation consists of assessing the regional impact dimensions of key economic benefits and costs. Regional Economic Development impacts were addressed in the Comprehensive Study. For each Project Implementation Report, the potential for regional impacts will be reviewed, compared with the estimates in the Comprehensive Plan and further evaluated.

### **3.3 Social Impact Analysis**

These studies constitute a means of identifying and displaying effects of alternative plans that are not reflected in the results of economic and environmental analyses. This work will focus on assessing the social impacts associated with local and regional economic impact analysis.

## **4.0 Engineering and Design**

The engineering appendix to the Project Implementation Report should include applicable items of the topics listed below and any additional information required for the specific project concerned. Comparative studies, field investigations, design and screening level cost estimates should be described in sufficient detail to substantiate the recommended plan and the baseline estimate. The level of design will be consistent with the engineering plan presented in the Project Management Plan.

### **4.1 Hydrology and Hydraulics**

This section will present the basis and results of hydrologic and hydraulic studies required for determining the functional design requirements. Explain the methods used, why they were selected and the basic assumptions on which these studies are based. Provide basic data, as appropriate, and discuss the limitations of the collected data. Present results and conclusions and

explain how they apply to design and real estate requirements. As appropriate for the specific type of project under development and to the extent necessary to support the project cost estimate, hydrologic studies shall include:

- Consequences of flows exceeding discharge capacity of the project
- Project-induced changes obligating mitigation
- Discharge-frequency relationships
- 0.2% chance of exceedance flood or SPF (0.5 probable maximum flood)
- Stage-discharge relationships
- Flow duration
- Flood inundation boundaries and flood stage hydrographs
- Reservoir yields
- Risk and uncertainty analysis for sizing of the project under study
- Water quality conditions
- Groundwater conditions
- Preliminary project regulation plan
- Preliminary Real Estate taking line elevations
- Criteria for facility/utility relocations
- Criteria for identification of flowage easements required for project function
- Criteria in support of project operation, maintenance and regulation requirements
- Environmental engineering considerations incorporated into the design and regulation plan
- In a separately identified section, present information about residual flooding; i.e., flooding from any source that will occur as a result of exceeding project capacity. This information shall identify, at a minimum, the following:
  1. Warning time of impending inundation
  2. Rate of rise, duration, depth and velocity of inundation
  3. Delineation on the best available mapping based on the extent of inundation for the 1% and 0.2% chance floods exceeding project designed. When appropriate include analyses of historic floods.
  4. Access and egress problems created by flooding
  5. Potential for loss of life
  6. Identification of any potential loss of public services
  7. Potential physical damages
- In a separately identified section, present information about flooding which will be induced by the project, such as flooding caused by project construction or operation as determined by comparing without-project to with-project conditions. This information shall identify, at a minimum, the following:
  1. Information categories required above
  2. Anticipated frequency of induced flooding

- Based on the design flood, also provide inundation risks during project life for the array of chance floods exceeding the 0.2% chance flood.

## **4.2 Hydraulic Studies**

Hydraulic studies shall include the following as appropriate:

- Hydraulic roughness determinations
- Water surface profiles
- Stage-discharge relationships
- Head loss
- Flow and velocity
- Structural sizing needed to meet design capacities including riprap or other slope protection
- Water control facilities
- Energy dissipating facility features
- Erosion control requirements
- Existing and post-project sedimentation
- Water control and order of work during construction
- Criteria for facility/utility relocations
- Other special facilities needed to meet project operation, water quality and environmental requirements
- Instrumentation and monitoring

## **4.3 Surveying, Mapping, and Other Geospatial Data Requirements**

Develop sufficient surveying, mapping and other geospatial data information to support the preparation of the Project Implementation Report and the Real Estate Appendix. A brief outline of additional surveying and mapping required for design, plans and specifications, construction and operations shall also be developed. The surveying and mapping information in the engineering appendix to the Project Implementation Report shall be sufficiently detailed to support the development of project real estate requirements and preparation of the Design Documentation Report and Plans and Specifications.

## **4.4 Geotechnical**

Develop, describe and present sufficient geotechnical information to verify the project plan, site selection, foundation design, structure selection and cost estimates. In the event only a minimum Design Documentation Report is to be prepared, the geotechnical information in the engineering

appendix to the project Implementation Report shall be sufficiently detailed to support the development of project real estate requirements and preparation of plans and specifications. This information shall include studies, methods, reasons for selection, and conclusions and recommendations as follows:

- Regional and site geology
- Completed exploration, including the number, size and type of exploratory borings; the number of pressure tests and pumping tests; and the number, size and type of exploratory excavations and the type of equipment used as well as descriptions of exploration and test results
- Selection of preliminary design parameters
- Groundwater studies, which shall include present conditions, anticipated changes, and the effects of those changes
- Preliminary foundation design and slope stability analysis
- Excavation plan with required blasting constraints and controls
- Anticipated construction techniques, limitations and problems
- Potential borrow sites and disposal sites
- Potential sources of concrete materials and results of materials investigations
- Potential sources and suitability of concrete materials and plant, earth and rock borrow material, and stone slope protection
- For projects where soils strongly influence the design and selection of structures and project features, perform sufficient physical property testing and discuss selected design values. Conduct probabilistic analyses when appropriate. Where leakage or seepage through, under or around water retention structures is indicated, adequate pumping or pressure tests shall be conducted and their results presented. Preliminary performance thresholds (seepage quantities, uplift, internal phreatic levels and movement) shall be described. Drawings shall include, but not be limited to, a plan of exploration, bedrock and groundwater contour maps, geologic sections (with interpretations), exploration records (logs of borings, exploratory excavation maps, etc.), and plans and sections of foundation design (founding elevations, excavation limits, reinforcement and treatment)
- A summary of any additional exploration, testing, and analysis required for the preparation of the Design Documentation Report and Plans and Specifications shall be provided
- A summary of the laboratory-testing program that was completed and a description of the evaluations made in the selection of the design parameters shall be included in the appendix.

#### **4.5 Environmental Engineering**

The following environmental engineering factors shall be incorporated into each aspect of the project.

- Use of environmentally renewable materials

- Design of positive environmental attributes into the project
- Inclusion of environmentally beneficial operations and management for the project
- Beneficial uses of spoil or other project refuse during construction and operation
- Energy savings features of the design
- Maintenance of the ecological continuity in the project with the surrounding area and within the region
- Consideration of indirect environmental costs and benefits
- Integration of environmental sensitivity into all aspects of the project
- Detailed review of the “Environmental Review Guide for Operations” with respect to environmental problems that have become evident at similar existing projects and, through foresight during this design stage, have been mitigated/addressed in the project design
- Incorporation of environmental compliance measures into the project design

#### 4.6 Civil Design

- **Site selection and project development.** Discuss the selection of the project site and evaluation of alternative layouts, alignments, components, aesthetics, relocation of facilities, etc., and describe components and features, including the improvements required on lands to enable the proper disposal of dredged or excavated material. In the event only a minimum Design Documentation Report is to be prepared, the site selection information in the engineering appendix to the Project Implementation Report shall be sufficiently detailed to support the development of project real estate requirements and preparation of plans and specifications.
- **Real Estate.** Develop and describe the engineering requirements relating to the determination of what lands, easements, right-of-ways, and borrow and disposal sites and areas for public access and use which are necessary for the construction, operation and maintenance of the project. Prepare preliminary design drawings depicting such engineering requirements for use by Engineering and Real Estate in jointly determining the project land requirements.
- **Relocations.** Describe the facility/utility relocations required as a result of the project. Discuss the methods proposed for accomplishing the relocations and the related land requirements.

##### 4.6.1 Structural Requirements

The following structural data shall be presented in the engineering appendix. In the event only a minimum Design Documentation Report is to be prepared, the structural information in the engineering appendix to the Project Implementation Report shall be sufficiently detailed to support the development of project real estate requirements and preparation of plans and specifications.

- Identify all functional design requirements and technical design criteria for the structural elements of the project. Include references, loads, load combinations, load factors, safety factors and assumed or calculated uplift pressures.
- Identify appropriate survey, hydrologic, hydraulic and geotechnical data used as the basis for structural design. Also identify key design data obtained through coordination with other disciplines (e.g., machinery loads).
- Provide the structural basis for site selection studies. Include descriptions of any structural measures to maintain or enhance environmental quality.
- Provide the technical basis for selection of type and configuration of main and major appurtenant structures for all of the alternatives studied.
- Describe evaluation and selection of substructure alternatives based on economy and performance.
- Describe site restrictions, probable construction techniques and sequence as well as plans for dewatering and care of water. Indicate how these considerations affected evaluation of the alternatives.
- Provide results of stability analyses to show application of stability criteria, methods of analysis and assumptions for each type of structural monolith. The analysis summary for all monoliths should be sufficient to reduce cost contingencies to an acceptable level.
- Provide results of initial stress analysis to show application of strength criteria, methods of analysis, assumptions and key dimensions of components of each major structural system. The analysis summary for all structural elements should be sufficient to reduce cost contingencies to an acceptable level.
- Identify plans for further studies, tests and analyses after the feasibility phase. This shall include identification of any significant unresolved design issues, an evaluation of how these issues affect current cost contingencies, and how they may impact design costs and schedules.

#### **4.6.2 Electrical and Mechanical Requirements**

Identify all functional design requirements and technical design criteria for the electrical and mechanical systems and equipment of the project. Provide the technical basis for selection of type and configuration of electrical and mechanical equipment. In the event only a minimum Design Documentation Report is to be prepared, the electrical and mechanical information in the engineering appendix to the feasibility report shall be sufficiently detailed to support the development of project real estate requirements and preparation of plans and specifications.

#### **4.6.3 Hazardous and Toxic Materials**

Based on previous land usage, when the potential for the presence of hazardous and toxic materials exists, perform and report upon sufficient investigations and testing to identify the nature and extent of such materials. Include the estimated cost for remediation design and/or treatment and/or removal/disposal of these materials in the baseline cost estimate. In the event only a minimum Design Documentation Report is to be prepared, the hazardous and toxic waste information in the engineering appendix to the Project Implementation Report shall be

sufficiently detailed to support the development of project real estate requirements and preparation of plans and specifications.

#### **4.6.4 Construction Procedures and Water Control Plan**

Briefly describe the procedure and schedule for producing the water control plan and the construction procedure for each construction stage of the proposed plan. Sufficient hydraulic hydrologic data, hydrographic and topographic information, structural information, geologic, and soil and environmental information shall be included to support the general features of the water control plan. The plan should also discuss erosion and sedimentation control.

#### **4.6.5 Operation and Maintenance**

Describe the plan proposed for operation and maintenance as well as provide detailed estimates of the Federal and non-Federal costs and a chart of the proposed Federal and non-Federal organizations.

#### **4.6.6 Access Roads**

Describe the proposed permanent access roads and those for use during construction of the project. Describe the suitability of temporary access roads for permanent use upon completion of construction. The authority to utilize, improve, reconstruct and maintain existing public roads for access to the project during construction contained in Section 207(a), Public Law 86-645 as amended by Section 208 of Public Law 87-874, shall be considered when this is more economical than provision of a new access road. If studies indicate that the use and improvement of an existing public road for access meet the requirements of the cited legislation, the basic cost comparisons and criteria including views of local interests exercising jurisdiction over the road, shall be included in the engineering appendix or in a Design Documentation Report. The cost estimate shall show separately the cost of improving the public road, the cost of constructing the remaining portion of road and the total cost. These data are necessary for a determination pursuant to the above-cited law.

#### **4.6.7 Corrosion Mitigation**

When the water analysis and soil determinations indicate that corrosion mitigation may not be required, the survey data, conclusions and recommendations can be presented as a section of the appendix. If it appears that extensive corrosion mitigation will be required, a Design Documentation Report shall be submitted to present complete information covering the results of surveys and tests. This report will determine the corrosion characteristics of the water and soil at the site, the conclusions reached and the proposed solution. The water analysis shall be complete, including resistivity, and pH at the site.

#### **4.6.8 Cost Estimates**

The development of an accurate baseline cost estimate that represents the scope and schedule established in the Project Implementation Report is essential. The baseline cost estimate



documentation submitted will include the summary sheets for direct costs, indirect costs and owner costs to the sub-feature level for all features and a total project cost summary that addresses escalation through project completion. It must contain a narrative that discusses cost relationships and assumptions made based on the level of design, quantity issues and unknowns. The narrative shall also identify the risks or uncertainties used in the development of contingencies.

#### **4.6.9 Schedule for Design and Construction**

In coordination with the construction staff, provide the estimated time required for construction of the project and its principal components. Provide a schedule to show the sequence of proposed land acquisition, design and construction operations, and the funds required by fiscal year.

#### **4.6.10 Plates, Figures, and Drawings**

Plates, figures and illustrations that use color in originals to differentiate project features must also include colored copies in documents forwarded for review. Otherwise, project features shall be identified by the use of varied shading, bars, crosshatch, etc., in order to differentiate specific items in monochromatic copies. When photographs are used to illustrate project features, they shall be clear and provide interpretive value.

### **5.0 Real Estate Plan**

Each Project Implementation Report will contain a real estate plan that will set forth for each project purpose/feature, a description of lands, easements and rights-of-way required for construction, operation and maintenance of the project commensurate with the level of detail provided by other elements. The real estate document will contain decision-level information on the acreage, estates, number of tracts and ownership, estimated value and other pertinent real estate information. If any decision information that would normally be contained in the real estate plan is not available, the real estate plan will provide a detailed description of the missing data and relevance to formulating real estate requirements. In these cases, real estate and its value will be presented in a range of possibilities. The real estate document will provide the acreage in the stage or phase consistent with the description of the project as fully as possible. If the level of detail required is not available during preparation of the Project Implementation Report, more detail will be provided in the appropriate design documents.

#### **5.1 Obtain Rights of Entry**

Upon a notification of request for rights of entry by section, township and range parameters, permission will be obtained from the landowners to temporarily use his/her land for a specified time and purpose. This permission will be obtained for the purposes of environmental investigations, cultural assessments, core sampling, surveys and explorations, etc. Staff contractors performing the

above services will be directed to obtain the rights of entry, however, real estate staff will assist if necessary.

## **5.2 Ownership Information**

Upon notification of alternative component feature description and location by section, township and range parameters, the following data and information for areas under consideration for project features will be obtained:

1. A description of lands, easements and rights-of-way required for the project, including acreage, estates, number of tracts and ownership. A description of the lands owned by the private parties, other public entities and the non-Federal sponsor, together with the acreage and interest owned.
2. Information of public utilities within the project area
3. Tax maps of the lands upon which project features lie
4. Zoning information

## **5.3 Section Corner Survey**

A survey is required to establish coordinates for approximately 30 Sections and 12 Townships for real estate mapping purposes.

## **5.4 Physical Takings Analysis**

A Takings Analysis will be completed, depending on the information available, and will discuss the potential impact of induced flooding on real estate requirements. A discussion of whether there will be flooding induced by construction, operation and maintenance of the project would not be included in the real estate plan. If the level of detail required for a Takings Analysis is not be available for the Project Implementation Report, more detail would be provided in appropriate design documents.

## **5.5 Preliminary Real Estate Cost Estimates**

Prepare lands, easements, rights-of-way, relocations and disposal area preliminary cost estimates for multiple components for initial screening during the plan formulation stage of the study. This will require a similar method of estimating costs performed during the reconnaissance phase. The preliminary cost estimates along with the previously mentioned ownership information will be compiled in the Geographic Information System database as polygon attributes for use in the evaluation analyses.

## **5.6 Gross Appraisal**

This activity includes the activities necessary to complete a detailed, supported appraisal of the collective real estate requirements and impacts of the recommended plan as required by Engineering Regulation 405-1-12, (Chapter 4 and Draft Chapter 12).

## **5.7 Real Estate Supplement**

The Real Estate Supplement/Plan to the Project Implementation Report will outline the minimum real estate requirements for the proposed project. The real estate plan will also provide:

1. A description of lands, easements, and rights-of-way required for the project, including acreage, estates, number of tracts and ownership. This will include a description of the lands owned by the private parties, other public entities and the SFWMD, the acreage and interest owned and whether the existing estates held by the SFWMD are sufficient and available for the project. The real estate plan will also discuss crediting issues.
2. Copies of recommended estates and proposed non-standard estates together with adequate justification for the estates will be provided, but this information will depend on detail in the main body of the Report.
3. A description of whether there is an existing Federal project that lies fully or partially within the lands, easements, and rights-of-way required for the project.
4. Information as to whether there is Federally owned land within the lands, easements, and rights-of-way and the purpose for which land was acquired.
5. Information as to the extent of lands, easements, and rights-of-way that lie below the ordinary high water mark. If this information is not available, the real estate document will state that an analysis will be completed during the preparation of design documents for the project.
6. A general map that depicts the project area. The map may depict tracts, known to be required to support the project, known utilities and facilities to be relocated and any known hazardous, toxic and radioactive waste lands.
7. A discussion of whether there will be flooding induced by the construction, operation or maintenance of the project.
8. A baseline cost estimate, which will be based on a possible combination of a range of values similar to the Reconnaissance phase plus some level of detail sufficient for a gross appraisal. All known costs associated with real estate costs will be included. For those costs not included, an explanation will be provided.

9. Relocation assistance benefits anticipated to be required and availability of replacement or last resort housing will be presented, where possible, in the real estate plan. This level of detail will most likely not be available for the Project Implementation Report. More detail will be provided for the appropriate design documents.
10. A description of present or anticipated mineral activity in the vicinity of the proposed project.
11. An assessment of the SFWMD's legal, professional capability to acquire lands, easements and rights-of-way.
12. A discussion on enactment of known or anticipated zoning ordinances.
13. A reasonable and detailed schedule of all land acquisition milestones including lands, easements and rights-of-way certification.
14. A determination of known facilities and utilities that must be relocated including roads, pipelines, etc. will be documented in a Preliminary Attorney's Opinion of Compensability.
15. Information and a discussion of impacts on the real estate acquisition processes due to a known or suspected presence of contaminants in, on, under or adjacent to lands, easements and rights-of-way.
16. A discussion of known or anticipated support for, or opposition to, the project by landowners in the project area.
17. A statement that the non-Federal sponsor has been notified in writing about the risks associated with acquiring land before execution of the Project Cooperation Agreement.
18. A description of any other known real estate issues relevant to the planning design or project implementation.
19. A chart of accounts containing all known real estate costs and contingencies will be prepared and included in the Real Estate Plan.

## **6.0 Suggested Format for Project Implementation Reports**

### **Summary**

#### **Section 1 Introduction**

Study Authority

Study Purpose and Scope

Study Area

National Environmental Policy Act Requirements

Study Process

Other Studies, Reports and Projects

## C&SF Project Authorizations

### **Section 2 Historic Conditions**

Description of the natural system

### **Section 3 Existing Conditions\***

Geology and Soils

Climate

Air Quality

Noise

Vegetation

Fish and Wildlife

Threatened, Endangered and State Listed Species

Water Management

Water Quality

Water Supply

Socioeconomics

Land Use

Recreation Resources

Aesthetics

Cultural Resources

Hazardous, Toxic and Radioactive Waste

### **Section 4 Future Without Plan Condition\***

With-and-Without Comparisons

Project Life

Planning Horizon

Climate

Sea Level Rise

Population and Socioeconomic Conditions

Land Use and Land Cover

Water Quality

Urban and Agricultural Water Supply Demands

Physical Facilities and Operations

Land Acquisition Programs

Recreation

### **Section 5 Problems and Opportunities**

Public Concerns

Ecological Problems and Opportunities

Water Quality Problems and Opportunities

Economic and Social Well-Being Problems and Opportunities

Recreation and Public Access Problems and Opportunities

Planning Goals and Objectives

## **Section 6 Plan Formulation and Evaluation**

Plan Formulation and Evaluation Methodology

Final Array Of Alternative Plans

Economic Evaluation of the Alternative Plans

Environmental Evaluation of the Alternative Plans

Cost Effectiveness and Incremental Cost Analyses

Fish and Wildlife Mitigation Analysis

Uncertainty Analysis

Planning Criteria

Evaluation Accounts

## **Section 7 RECOVER**

RECOVER Coordination/Activities

## **Section 8 Environmental Effects\***

Soils

Geology

Climate

Air Quality

Noise

Vegetation

Fish and Wildlife

Threatened and Endangered Species

Water Management

Water Quality

Water Supply

Socioeconomics

Land Use

Recreation Resources

Aesthetic Resources

Cultural Resources

Hazardous, Toxic and Radioactive Wastes

Unavoidable Adverse Environmental Effects

Relationship Between Short-Term Uses and Long-Term Productivity

Irreversible and Irretrievable Commitments of Resources

Cumulative Effects

## **Section 9 Recommended Plan**

Construction Features

Operational Features

Real Estate

Land Acquisition

Relocation Assistance (Public Law 91-646)

Adaptive Assessment and Monitoring Program

Adaptive Assessment Program

Monitoring Program

- Monitoring Program Planning Guidelines
- Fish and Wildlife Mitigation
- Cost Estimate
  - Initial Costs
  - Adaptive Assessment and Monitoring Costs
- Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) Costs
  - Annual Costs
  - Cost Estimate Uncertainties
- Cost Sharing
  - Cost Sharing of Water Quality Features
  - Cost Sharing of Construction and Land Costs
  - Cost Sharing of Adaptive Assessment and Monitoring
  - Cost Sharing of Operations, Maintenance, Repair, Replacement and Rehabilitation

## **Section 10 Public Involvement and Coordination\***

- Public Involvement Program
- Scoping
- Other Required Coordination
  - U.S. Fish and Wildlife Service
  - Florida Fish and Wildlife Conservation Commission
  - Florida State Historic Officer
  - National Oceanic and Atmospheric Administration
- Stakeholder Involvement and Outreach
- Review Conferences
- Public Meetings

## **Section 11 Compliance with Environmental Requirements\***

- National Environmental Policy Act Of 1969
- Fish and Wildlife Coordination Act Of 1958
  - U.S. Fish and Wildlife Service draft Fish and Wildlife Coordination Act Report Recommendations
  - U.S. Fish and Wildlife Service final Fish and Wildlife Coordination Act Report Recommendations
  - Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Coordination Act Report
- Endangered Species Act of 1973
- National Historic Preservation Act of 1966
- Clean Water Act of 1972
- Safe Drinking Water Act of 1972
- Clean Air Act of 1972
- Coastal Zone Management Act of 1972
- Farmland Protection Policy Act of 1981
- Wild and Scenic River Act of 1968
- Estuary Protection Act of 1968
- Federal Water Project Recreation Act of 1965
- Resource Conservation and Recovery Act of 1976

Toxic Substances Control Act of 1976  
Marine Protection, Research and Sanctuaries Act of 1972  
Rivers and Harbors Appropriation Act of 1899  
Coastal Barrier Resources Act  
Section 904 of The 1986 Water Resources Development Act  
Section 307 of The 1990 Water Resources Development Act  
Executive Order 11988, Floodplain Management  
Executive Order 11990, Protection of Wetlands  
Executive Order 12114, Environmental Effects Abroad of Major Federal Actions  
Executive Order 12898, Environmental Justice

## **Section 12 State Review and Funding**

Section 373.026(8)(b) of the Florida Statutes  
Section 373.1501 of the Florida Statutes  
    Section 373.1501(5)(a): Comprehensive Needs Analysis  
    Section 373.1501(5)(b): Engineering Feasibility and Cost Effectiveness  
    Section 373.1501(5)(c): Permitability/Operability  
    Section 373.1501(5)(d): Existing Users/Level of Service  
    Section 373.1501(5)(e): Utilities/Public Infrastructure  
Section 373.470 of the Florida Statutes

## **Section 13 Recommendations**

## **Section 14 List of Study Team Members, Report Preparers and Independent Technical Reviewers**

## **Section 15 Glossary of Terms, Acronyms and Abbreviations, and Conversion Tables**

## **Section 16 References\***

## **Section 17 Index\***

## **Annexes**

Fish and Wildlife Coordination Act Report  
Programmatic Biological Opinion  
Section 404(b)(1) Evaluation  
Coastal Zone Consistency Evaluation

## **Appendices**

Plan Formulation  
Hydrology and Hydraulics Modeling  
Engineering, Design and Cost Estimates  
Environmental Evaluation Analyses  
Socioeconomics  
Real Estate



Local Cooperation and Financial Analysis  
Water Quality  
Existing Condition  
Environmental  
Comment/Response  
Comprehensive Plan Modifications

Note: \* Required for National Environmental Policy Act compliance

# **APPENDIX E**

## **DESCRIPTION OF FORMAT AND CONTENT FOR DESIGN DOCUMENTATION REPORTS**

### **1.0 General Introduction to Design Documentation Reports**

The Design Documentation Report is required for all engineering design products. It is an implementation document that provides the technical basis for a project's plans and specifications. It serves as a summary of all engineering design and design decisions made by the Project Delivery Team during project development. The Design Documentation Report covers the preconstruction engineering and design phase through to project completion. The Design Documentation Report is not complete until both plans and specifications and construction phases are finished.

This appendix is intended to provide guidance to project managers working within the Comprehensive Plan on the development of a Design Documentation Report. It provides general guidance and recommendations on the development process as well as general document format and content. The guidance contained in this appendix is intended to be general in nature as it is expected that each project within the Comprehensive Plan will have unique requirements that will evolve over the lifecycle of the project.

This appendix is divided into sections that correspond with the sections of the Design Documentation Report. Within each section of the appendix a narrative describing the format and content pertaining to the subject of the section will be presented. The actual Design Documentation Report will be assembled as a separate document in a loose-leaf notebook for easy updating.

### **2.0 Format Guidelines for the Design Documentation Report**

An official copy of the final Design Documentation Report is necessary for construction support, reference, future projects, and litigation. The complete design analysis and Design Documentation Report will be maintained in the official files for as long as the project exists. It may be produced in the form of a bound hard copy or any permanent electronic media such as CD-ROMs, in accordance with this appendix and the following guidelines:

- **Table of Contents** - To facilitate references and review, each Design Documentation Report will have a table of contents, which identifies major paragraphs of the text, appendices and graphical information. It will include all major paragraph titles, paragraph numbers, page numbers and a list of graphical information.
- **Text** - All text paragraphs will be numbered or lettered.

- **Graphical Information** - Graphical information will be appropriate for binding and filing.
- **Calculations** - Calculations and summaries of analysis results will be presented in appendices, in a form readable and understandable for the reviewer. Unnecessary pages such as repetitive trials and errors will be deleted. Calculations will always include page numbers and will be preceded by a detailed table of contents.
- **Syllabus** - A summary of project data applicable to the feature being presented will be included.

### **3.0 Content Guidelines for the Design Documentation Report**

The Design Documentation Report will contain a full record of design decisions, assumptions and methods, subsequent to the Project Implementation Report. It will be sufficiently clear so that an engineer or individual not familiar with the project could review the Design Documentation Report and understand how the project evolved into its final configuration, and why each key decision was made. It will be sufficiently detailed for each technical specialty so that the criteria employed, the critical assumptions that were made, and the analytical methods used will be evident for purposes of review and historical documentation. The report will also contain summarized results of important calculations and selected example calculations for all critical elements of the design.

#### **3.1 Project Description**

A general description of the entire project as set forth in the Project Implementation Report will be provided. Any changes in project features now being considered and why these changes do not require a post-authorization change will also be included.

#### **3.2 Pertinent Data**

A tabular summary of essential data on the project such as construction cost, physical features, project purpose and controlling elevations (e.g., for design flood, real estate acquisition and relocations, etc.) will be included.

#### **3.3 References**

Basic data and criteria used in the design with references to applicable engineering manuals, regulations, guide specifications and any other sources of criteria will be listed. Approved criteria waivers will be referenced in the Design Documentation Report as well.

### **3.4 Engineering Studies, Investigations and Design**

The Design Documentation Report will include results of investigations, analyses and calculations made for the design of the project. For each technical specialty, clear definitions of all criteria, applicable analytical methods and pertinent assumptions will be included. The resulting documentation will contain all the information necessary to support an independent technical review. Such information will include, as applicable, the following:

- Determination of final location and resulting site plan for specific features.
- Refinements to project hydrology for specific features.
- Determination of pertinent hydraulic design features, flow characteristics and discharge capacities, but not detailed design computations, except in unusual or unprecedented cases when such computations will facilitate review. Sufficient detailed design will be included for the Independent Technical Review Team and for the plans and specifications of critical spillways as well as other water control structures and refinements to levee alignments.
- Design of water surface profiles, discharge coefficients and curves as well as other plotted data or tabulations.
- Stability safety factors, applied loads, load factors and material strengths will be listed along with comparisons between calculated values and criteria requirements. Typical calculations will be included for selected critical elements. Summaries of results will be provided for remaining elements. Analyses will document the final structural design for the project, except for detailing requirements.
- Results of geotechnical investigations.
- Determination of adequacy and use of materials, strengths, stability and slopes and the protection of critical sections of embankments and foundations. Examples of calculations for slope stability, consolidation, settlement, bearing capacity and seepage analyses will be included.
- Determination of source, adequacy and use of construction materials, or appropriate references to a previously prepared Design Documentation Report on the subject.
- Determination of the most effective project site water control plan including, but not limited to, dewatering and pressure relief. A determination of the appropriate sequence of work, resulting in the least damage to property, delay in construction or possibility of failure. The level of flood protection and risk during construction also will be addressed.
- Design computations to determine the size, strength, rating, adequacy and interrelationships of electrical and mechanical items will be included. Design computations to develop details will be for unusual cases where such details are critical.

A summary of critical aspects of electrical and mechanical features that have been added since completion of the Project Implementation Report will be incorporated. A description of the operation and maintenance requirements will also be included. The Design Documentation Report will contain a refinement of project quantities and cost estimates including operation and maintenance cost data.

- Results of investigations and analyses that led to required feature relocations different from those identified in the Project Implementation Report. Documentation of coordination efforts with real estate elements to address changes in required relocations will be included.
- Determination of the water quality characteristics of a proposed impoundment and the ability of the project's outlet works and regulation scheme to meet downstream water objectives.
- Design of disposal areas for cleared and excavated material including access, grading, erosion and sediment control.
- Summary of hazardous toxic and radiological waste considerations related to worker health, safety and disposal requirements.
- Discussion of hazardous toxic and radiological waste remediation requirements and other actions required between the Corps and the SFWMD prior to construction and allowable hazardous toxic and radiological waste levels at the start of construction. Also, include a summary of any hazardous toxic and radiological waste investigations, regulatory compliance issues and remedial activity.
- Copies of correspondence with manufacturers concerning items presented in the design. Also, when no additional environmental documentation is required, copies of correspondence documenting additional coordination with state natural and cultural resource agencies since completion of the Project Implementation Report will be included.
- Operation and maintenance requirements to be included in the operation and maintenance manual.
- Description of the facilities designed to accommodate the physically handicapped.
- Results of water analysis and soil testing to determine the need for corrosion mitigation. The water analysis will include resistivity and pH at the site. If it appears that extensive corrosion mitigation will be required, complete information on the results of surveys and tests to determine the corrosion characteristics of the water and soil at the site. The conclusions reached and the solution will be presented in detail, listing the materials and/or methods proposed for use.

- A summary of all environmental engineering factors and considerations that have been incorporated into the project as established in the authorizing document. This includes a discussion of the environmental impact of proposed project features and measures proposed to mitigate any environmental damage or to enhance the environment. A brief discussion will specify any changes that will need to be reflected in the National Environmental Policy Act document. The views of natural and cultural resource agencies incorporated into project design or construction will be explained. A summary of any hazardous toxic and radiological waste investigations and any remedial activity will be included.
- A reference to all value engineering studies prepared for the current design, including a summary of significant value engineering proposals will be incorporated.

### **3.5 Graphical Information**

Design drawings, sketches, charts, diagrams, maps, profiles or other graphical information necessary to clearly illustrate the design will be included or referenced in the contract plans. The maps will clearly identify all places mentioned in the text of the Design Documentation Reports.

### **3.6 Cost Estimates**

Cost estimates will be based on quantities and unit prices, historical data or cost models, depending on the level of design information available. The method selected must be equivalent and establish reasonable supportable costs for comparison of alternate designs.

### **3.7 Technical Review Documentation**

Reviews by the Project Delivery Team and the Implementation Technical Review Team will be documented in the Design Document Report. Documentation of in-progress reviews at key decision points in the design process resolutions and agreements reached in technical review conferences, and annotated comments that surfaced during the independent technical review process will be included. Technical review documentation will be included as an appendix in the Design Documentation Report. In addition, a copy of the Statement of Technical and Legal Review for both the design and plans and specifications processes will be included in the Design Documentation Report. The documentation from the Implementation Technical Review Team required by the Quality Control Plan may either be included or referenced in the Design Documentation Report.

## APPENDIX F

### PROGRAMMATIC ACTIVITIES

#### 1.0 Introduction

This appendix describes system-wide or programmatic activities that will be conducted under the Design Agreement. Programmatic activities are activities and tasks that are not linked to a specific project, but involve or affect more than one project or the entire restoration program. These activities include Restoration Coordination and Verification (RECOVER), public outreach, socioeconomic and environmental justice studies, program management and technical coordination activities and other program-level activities. Detailed management plans will be developed for these activities in order to coordinate and manage the program-level tasks. The management plans will outline what tasks are to be accomplished, when they will be accomplished, and which agency will be responsible for them. Consequently, these activities are described in this appendix in a general manner. The annual work plan will outline the programmatic tasks to be accomplished each fiscal year.

#### 2.0 Program Management and Technical Coordination Activities

Because of the large number of projects that will be undergoing concurrent planning, engineering and design under this program, a significant management and coordination effort will be required. This section summarizes some of the program management and technical coordination tasks that will be conducted during the period of design.

Program Management - Program management activities will include staffing and resource planning; program oversight and issue resolution; coordination and communications with the Corps' higher authority and SFWMD Governing Board; technical briefings for congressional and legislative committees; and coordination of Comprehensive Plan implementation activities with other interdependent restoration programs and projects.

Design Coordination Team - The Design Coordination Team will provide technical and managerial oversight for design of the program. This oversight will include various activities associated with review of design schedules and budgets, design plans and work products, Restoration Coordination and Verification plans and recommendations, issue resolution and other related matters.

Updating the Master Program Management Plan - The Master Program Management Plan describes the framework and processes to be used by the Corps and the SFWMD while implementing the Comprehensive Plan. This activity includes developing the initial Master Program Management Plan as well as updating the document. Volume I will be updated, as necessary, to incorporate improvements and

refinements in processes and protocols. Appendices A and B of Volume II will be updated in the spring of each year. A draft update of the two appendices will be completed by March 1<sup>st</sup> to guide the development of the SFWMD's upcoming fiscal year budget request. The appendices will then be updated by April 15<sup>th</sup> to include actual expenditures through the end of second quarter (March 31). The April 15<sup>th</sup> update will be used to refine the SFWMD's budget request and help the Jacksonville District prepare its next budget request. The entire Volume II Annual Report and Work Plan, including Appendices A and B, will be updated in November of each year. The November update will include actual expenditures through the end of the previous fiscal year (September 30).

*Development and Delivery of Legislatively Mandated Reports* - It is anticipated that future state and federal legislation will require periodic reporting to Congress and the Florida Legislature on the technical and financial status, progress and plans for implementation of the Comprehensive Plan.

*Partnering Workshops* - Partnering workshops between key personnel at the Corps and SFWMD will be held, as necessary, to strengthen the partnership between the agencies. These workshops will involve program and project managers as well as managers and senior staff from both agencies.

*Training for Implementation of the Comprehensive Plan* - Because of the large number of projects that will be implemented within a relatively short time period under this program, the Corps and SFWMD will be engaging many new project managers, study managers and project delivery team members that were not involved in the extensive planning effort leading to development of the Comprehensive Plan. To ensure efficient and effective implementation and management of these projects, training courses that are specifically tailored to implementation of the Comprehensive Plan will be developed and conducted.

*Teambuilding Activities* - Implementation of the Comprehensive Plan will take place over a long time period and will involve the coordinated efforts by a large number of agencies with diverse missions and priorities. Teambuilding activities such as facilitated workshops will be conducted to improve communication and decision making among team members and their agencies.

### **3.0 Program Controls**

A set of program controls will be established to provide Program Managers and project managers with processes and tools to manage and control costs, schedules and resources resulting in high quality products delivered on time and within budget. Effective information management is a critical component of program controls for a program the scope and magnitude of the Comprehensive Plan.



The Corps and SFWMD will jointly develop detailed management plans for the program control activities. These management plans will describe the tasks necessary to implement the processes and tools as well as schedules, milestones, agency responsibilities and cost estimates for completing the tasks. Corps and SFWMD project managers will be appointed to ensure that each team responsible for developing and implementing the management plans understands the interrelationships between the program control activities and addresses those interrelationships in their management plans. The following management plans will be developed for program control activities:

*Establish a program and project cost accounting system* – This management plan will describe the scope, schedule and costs associated with establishing a program and project and cost accounting system to easily capture, track and reconcile costs related to the implementation of the Comprehensive Plan.

*Establish a shared data and information network* – This management plan will describe the scope, schedule and costs associated with design, procurement, installation and configuration of the hardware, software, network, security and data communication lines that comprise the shared data and information network.

*Establish a common program scheduling and tracking system* – This management plan will describe the scope, schedule and costs associated with the selection, procurement, installation, testing and implementation of a program scheduling and tracking system along with developing the methods and procedures to be used by both the Corps and SFWMD. This system will have one common repository of program and project data that will be accessible and shared by both the Corps and SFWMD and will also need to be integrated with the financial systems of both agencies to accurately track costs.

*Establish a document management and control system* – This management plan will describe the scope, schedule and costs associated with developing and implementing the protocols for tracking and storing all documents and records created during implementation of the Comprehensive Plan. A document management and control system will be implemented for collaboration, storage and retrieval of design products, records and documents, as well as information pertaining to design costs and expenses incurred. The Corps and SFWMD will develop and maintain a compatible document control system such that all information is readily available to both organizations with electronic posting to the shared data and information network.

*Establish standards and common formats for sharing of geospatial data* – This management plan will describe the scope, schedule and costs associated with the establishment of compatible standards for geospatial metadata, data projections, horizontal/vertical datums, file formats, compression techniques, file coding and file naming conventions. It will address the impacts of establishing new standards, for example, the need to convert geospatial data and models that have been written to access data in specific file formats, projections or datums.

Implement a real estate data management system – This management plan will describe the scope, schedule and costs associated with the development of efficient and effective business processes to support the land acquisition element of the Comprehensive Plan. A database and user interface will be designed and implemented to support the land acquisition process and ensure accurate and readily available real estate and land acquisition information.

Establish cost estimating and forecasting standards and protocols – This management plan will describe the scope, schedule and costs associated with the establishment of standards and protocols for collection, dissemination and reporting of all estimated direct project costs and overhead costs.

#### **4.0 Restoration Coordination and Verification (RECOVER)**

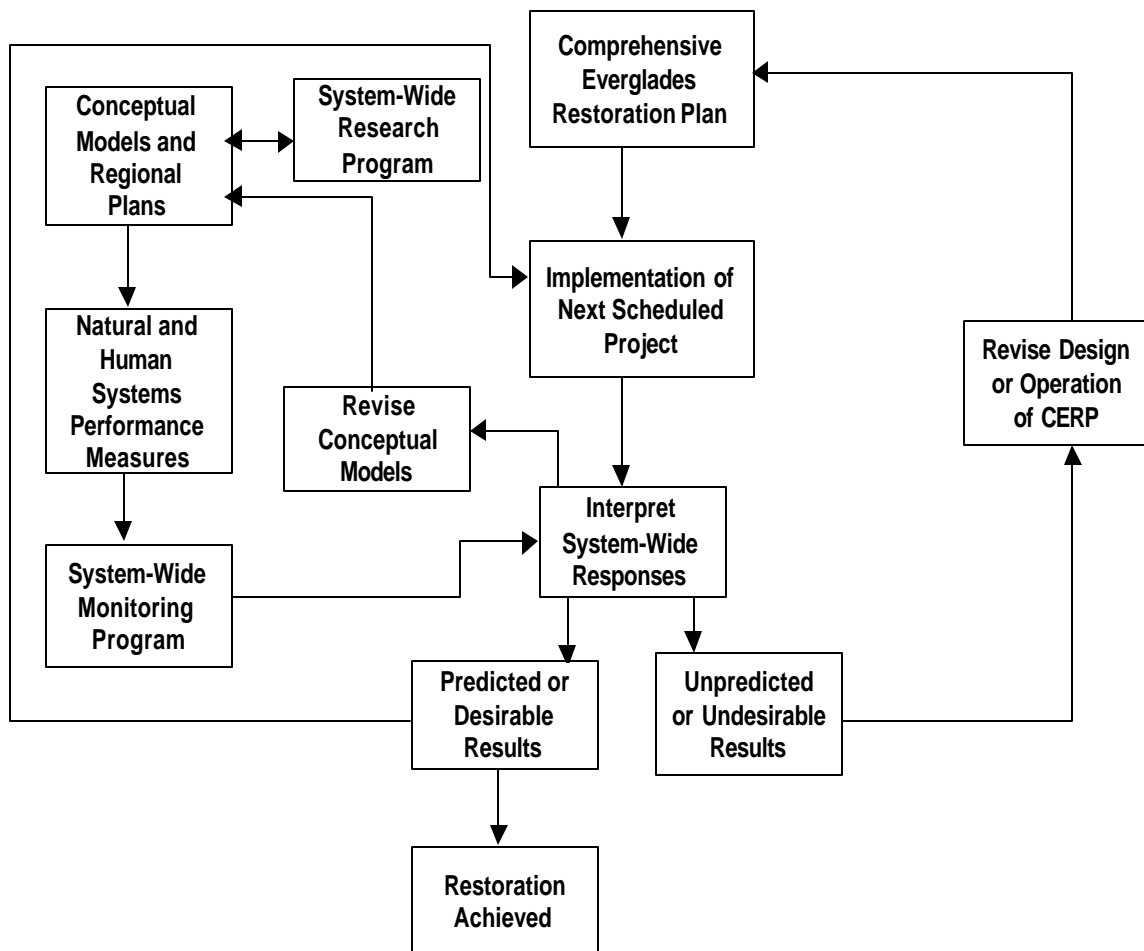
The role of Restoration Coordination and Verification (RECOVER) is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of the Comprehensive Everglades Restoration Plan. RECOVER links science and the tools of science to a set of system-wide planning, evaluation and assessment tasks. These links provide RECOVER with the scientific basis for meeting its overall objectives of evaluating and assessing Comprehensive Plan performance, refining and improving the plan during the implementation period, and ensuring that a system-wide perspective is maintained throughout the restoration program.

In order to establish and maintain an effective link between science and the Comprehensive Everglades Restoration Plan, the Central and Southern Florida Project Restudy Team created a process known as the Applied Science Strategy. The RECOVER team is responsible for the coordination and application of the components of the Applied Science Strategy during the implementation of the Comprehensive Everglades Restoration Plan. The major components of the science strategy are conceptual ecological models, performance measures and restoration targets, a system-wide monitoring and research program, and an adaptive assessment protocol.

The Applied Science Strategy depends on the creation of a set of conceptual ecological models. These models are used to identify the key physical, hydrological, and water quality stressors as well as biological indicators in the natural and human systems in south Florida. It is the stressors identified by the models that have substantially contributed to the degradation of the natural and human systems and which must be corrected by the Comprehensive Plan. Biological indicators are used to measure the success of the Comprehensive Plan in correcting the problems created by the stressors. These stressors and indicators become the basis for developing a regionally comprehensive set of performance measures, which are used to predict and evaluate how well the components of the Comprehensive Plan achieve the restoration and other water-related targets established for the plan. These measures and targets also identify the

elements of the natural and human systems that must be researched and monitored in order to determine how well the Comprehensive Plan is meeting its targets.

Responses measured by the system-wide monitoring program are used to direct an adaptive assessment process for the Comprehensive Plan. Adaptive Assessment is a primary means by which the Comprehensive Plan can be refined and improved throughout the period of implementation. The Adaptive Assessment process consists of a set of information feed-back loops, or decision points, which provide opportunities to recommend improvements in the plan when the monitoring and research program reveals that desired performance is not being realized. Adaptive Assessment also provides predictable points during implementation for reviewing and improving the performance measures and monitoring program used to determine the success of the Comprehensive Plan. The steps and feed-back loops in the Adaptive Assessment process are shown in Figure F-1.



**Figure F-1**  
**Adaptive Assessment Flow Chart**

RECOVER will meet its objectives by conducting a set of tasks, which are defined by the Applied Science Strategy. The major tasks are:

- Develop and refine conceptual ecological models
- Develop and refine performance measures
- Conduct evaluations of individual plan components or groups of components
- Develop and refine hydrological, water quality and ecological simulation models
- Design and implement a system-wide monitoring and data management program
- Coordinate peer reviews of the scientific basis of the Comprehensive Plan and recommend research priorities in support of the Plan
- Conduct annual assessments of system-wide responses to the Comprehensive Plan
- Recommend refinements and improvements to the plan design
- Recommend operational criteria and improvements in system-wide operational performance
- Issue an annual report card on the performance of the plan
- Maintain the most current version of the Comprehensive Plan and the Without-Project Conditions
- Coordinate the activities of the several RECOVER teams

These tasks will be conducted by the RECOVER teams as described in Volume I, Section 3.2.1 of this document as follows: Leadership Group, Adaptive Assessment Team, Regional Evaluation Team, Comprehensive Plan Refinement Team, Model Development and Refinement Team, and Operations Planning Team. The organization of the teams and the division of tasks among the teams will be evaluated and refined continually during the implementation of the Comprehensive Plan, in an effort to maximize the effectiveness of RECOVER. All products and reports of RECOVER will be provided for public and agency review.

#### **4.1 RECOVER Leadership Group**

The RECOVER Leadership Group will be responsible for coordinating and integrating the activities of the five RECOVER teams, and for ensuring that the overall focus and direction of the implementation process remains consistent with the goals of system-wide restoration.

*Develop and Update RECOVER Management plan* – A detailed management plan for RECOVER will be developed and updated as necessary. The plan will be used to guide RECOVER activities. It also will describe what needs to be done, how it will be done and the costs associated with the activities.

*RECOVER Management and Coordination* - This activity includes ongoing management responsibilities for the RECOVER team throughout the implementation effort. The Leadership Group will:

- Set overall priorities for RECOVER

- Make recommendations pertaining to the RECOVER budget
- Coordinate the application of available resources and personnel among the teams to best focus on priority tasks
- Revise the tasks and teams where needed to ensure that RECOVER meets its objectives
- Ensure appropriate public and agency review of RECOVER documents
- Refine the overall vision of success for the Comprehensive Everglades Restoration Plan.

Annual Report Card – The Leadership Group will produce an annual report card as a means of informing the public on the progress being made toward meeting the goals and targets of the Comprehensive Plan. The report card will describe the status and trends for a set of key indicators of environmental health for both natural and human systems in south Florida. These indicators will be graded annually, based on comparisons between the recent status of the indicators and the historical and pre-project conditions as well as the final or benchmark targets set by the Comprehensive Plan.

## **4.2 Adaptive Assessment Team**

The Adaptive Assessment Team will be responsible for all or part of five primary tasks of RECOVER.

Conceptual Ecological Models - A set of conceptual models is being developed for south Florida. These non-quantitative models are an effective means for identifying the most important anthropogenic stressors on the natural and human systems in the greater Everglades basin. Each model proposes a set of causal hypotheses to explain the ecological linkages between the stressors and a set of biological attributes (indicators) that are representative of the changes that have occurred as a result of the stressors. Once agreement is reached regarding the components and linkages in the conceptual models, it is then possible to identify the specific hydrological, ecological and biological measures of restoration success, and to design a system-wide, performance-based ecological monitoring program. Performance measures and restoration targets evolve from the stressors and attributes in the conceptual models.

Conceptual ecological models were developed for nine physiographic regions in south Florida during the feasibility phase of the Comprehensive Review Study. These models will require periodic updating to reflect new information and improved hypotheses. Additional models will be developed, including a total system model.

The conceptual models form the basis for the design of a system-wide monitoring program, and for recommendations for research priorities in support of the Comprehensive Plan. Comparisons between predicted responses among stressors and attributes as well as the actual responses measured by the monitoring program provide an opportunity to improve the conceptual models. Information obtained

through the monitoring program feeds into the Adaptive Assessment Strategy and thereby provides an opportunity for refinements to the Comprehensive Plan.

The Adaptive Assessment Team will periodically review and improve the conceptual models, and develop new models as needed. The team will maintain updated documentation for all models.

*Attribute-Based Performance Measures* – Performance measures are used to evaluate how well the Comprehensive Plan meets system-wide restoration and other water resource targets and how well individual components of the plan perform. Performance measures are developed for each attribute in the conceptual models. Attributes are the biological elements that are the best indicators of how the natural system responds to changes in the stressors. If the causal hypotheses are correct, reducing the adverse effects of the stressor will result in a predictable positive response by the attribute. Performance measures developed for each attribute identify how that attribute should respond, how to measure that response and what the restoration target should be. Over the course of the program, new performance measures will be created and old measures may be refined or replaced. All performance measures will be subjected to ongoing review.

The Adaptive Assessment Team will have the lead responsibility for developing and refining attribute-based performance measures. The team will create and maintain updated documentation for all performance measures used in the RECOVER process.

*System-wide Monitoring, Data Management and Annual Assessments of System Responses* – A large, complex regional restoration program must include a means for 1) monitoring how well the program meets its goals; 2), focusing research on questions that will lead to improved interpretations of monitoring results; and 3) improving the program as new information becomes available. For the Comprehensive Plan, an assessment process known as the Adaptive Assessment Strategy has been created for this purpose. Adaptive assessment monitors and interprets the responses by natural and human systems during and following the implementation of the restoration plan. These assessments are used as a basis for identifying opportunities for refining the plan and for recommending the specific changes that will produce the desired refinements.

Assessments are conducted from the time when one or more components of a program are constructed and become operational. These assessments will be based on measures of actual system responses that will be collected by a system-wide monitoring program. The monitoring program will be designed to track a set of indicator parameters and targets established by the planning teams during the formulation of the Comprehensive Plan, plus additional measures that will be developed by the Adaptive Assessment Team. Each assessment will require interpretation of the information gained from the monitoring program, which will be provided in annual status reports that describe how well the program components are meeting their targets.

To be successful, an Adaptive Assessment Strategy requires that certain processes contained within the strategy be implemented. These include 1) that key indicators of conditions in the natural and human systems be identified and appropriately monitored; 2) that it be possible to make design and operational changes to the program in response to system responses and the acquisition of new information; and 3) that a specific protocol for conducting the Adaptive Assessment Strategy be in place throughout the life of the program.

Monitoring, alone, is not sufficient for a program of adaptive assessment because many of the links between stressors and attributes in the conceptual models are uncertain. These uncertainties must be addressed because the models are the foundation of adaptive assessment. A long-term program of applied research and modeling, which is well-focused on improved understandings of fundamental cause and effect relationships in south Florida ecosystems, therefore, is considered to be an essential component of the overall assessment program. The adaptive assessment team will use the conceptual models as a basis for recommending research that will lead to improved design and interpretations of the system-wide monitoring program.

The Adaptive Assessment Strategy provides a framework for strengthening interagency and interdisciplinary coordination and validating the performance of program components as each are implemented. It will substantially improve the probability that the Comprehensive Plan will be successful and accountable by providing a structured, well-focused process for assessing the performance and, where needed, refining the design of the plan on a continuing basis throughout its implementation.

The Adaptive Assessment Team will design and periodically update a recommended system-wide monitoring plan in support of the Comprehensive Plan. The four objectives of the monitoring plan will be to 1) establish pre-project baseline conditions for the performance measure targets; 2) measure status and trends; 3) detect unexpected responses; and 4) improve understandings of cause and effect relationships in the natural and human systems. The team will issue annual assessment reports on system-wide responses to the Comprehensive Plan for each of the elements being monitored.

The Adaptive Assessment Team will be responsible for overseeing the design and implementation of a system-wide data management program needed to support the annual assessments of the Comprehensive Plan. This task includes acquisition and development of geospatial data as well as the analysis, design, development, testing and implementation of databases, user interfaces and tools in accordance with the standards established under Program Controls in Section 3.0 of this appendix. This database will be expanded to meet the needs of the adaptive assessment program, as necessary.

Scientific Peer Review - The RECOVER process is designed to ensure a strong scientific basis for the Comprehensive Everglades Restoration Plan. A fundamental means for strengthening the quality of the science that is applied to the Comprehensive Plan is through independent peer review of appropriate technical documents either used in the development of the Comprehensive Plan and/or produced by RECOVER teams. Documents that have been identified at this time for peer review include the conceptual ecological model reports, documentation of the various predictive models, the system-wide monitoring plan and the annual adaptive assessment report. RECOVER will utilize established peer-review processes, created by the south Florida Ecosystem Restoration Task Force and Working Group and the SFWMD, for reviews of these documents. These established processes include the Science Coordination Team, the National Academy of Science's Committee on Restoration of the Greater Everglades Ecosystem, and the SFWMD Expert Assistance Program.

#### **4.3 Regional Evaluation Team**

The Regional Evaluation Team will perform two primary tasks.

Stressor-Based Performance Measures - Performance measures are used to evaluate how well the Comprehensive Plan meets the system-wide restoration and other water resource targets. Performance measures also serve to evaluate how well individual components or groups of components of the plan perform. Stressors are the physical, hydrological or water quality changes that are the sources of the problems in the natural system. A successful restoration program must remove the adverse affects created by each stressor. Performance measures identify which elements of each stressor must be corrected, how those elements should be measured and how those elements must change in order to eliminate or reduce their adverse effects.

All performance measures will be subjected to ongoing review. Over the course of the program, the Regional Evaluation Team will review existing stressor-based performance measures, create new performance measures, and refine, replace or eliminate measures as needed. The team will ensure that all performance measures have restoration targets that are consistent with the overall goals of the restoration plan, and will set standards for developing performance measures and indicator regions as well as the uniform application of the measures.

System-Wide Evaluations of Project Components and Other Ongoing Activities - To maintain the system-wide focus of the restoration effort, the effects of incrementally implementing projects of the Comprehensive Plan will be evaluated during the development of each Project Implementation Report. In addition, the affects that other regional restoration plans, new feasibility studies or water supply plans may have on the objectives of the Comprehensive Plan will be evaluated. Landscape-level benefits will be measured using system-wide performance measures. The predicted system-wide performance of the plan will also be evaluated whenever any of the



system-wide models are improved to the point where responses by the performance measures could be altered.

Members of the Regional Evaluation Team will participate in the Project Implementation Report process to help ensure that the detailed design of each project is maximally effective in meeting the system-wide objectives of the Comprehensive Plan. The Regional Team evaluations will provide a check on whether the performance of each project meets or exceeds expectations, or in cases where performance does not meet Comprehensive Plan projections, to convey this information to the Comprehensive Plan Refinement Team. The Regional Team will work with the Project planners to look for opportunities to improve the performance of the Comprehensive Plan.

#### **4.4 Comprehensive Plan Refinement Team**

The Comprehensive Plan Refinement Team will recommend refinements and improvements to the Comprehensive Everglades Restoration Plan throughout the implementation period. The Comprehensive Team will link closely with the other four RECOVER teams for identifying the potential nature of needed plan refinements and the ways of designing the changes.

*Comprehensive Plan Refinement* - Refinement of the Comprehensive Plan will be ongoing throughout the implementation period. Refinements will occur, in large part, in response to activities carried out by the RECOVER process, including the evaluations of individual components or groups of components of the plan, the annual adaptive assessment reports, the continuing development of conceptual ecological models and improvements in simulation models. Results of pilot projects, new feasibility studies and other ongoing activities (e.g., Lower East Coast Regional Water Supply Plan, Modified Water Deliveries to Everglades National Park) may additionally require refinements to the Comprehensive Plan. This process of refinement to the plan will ensure continuity of the system-wide objectives of the plan.

The Comprehensive Plan Refinement Team will resolve any system-wide problems created as the influences of individual projects are modeled, which cannot be resolved by the Regional Evaluation Team through adjustments to the local projects or local performance measures. The Comprehensive Plan Refinement Team also will resolve any performance issues that occur as a result of improvements in the simulation models, improvements in performance measures, or whenever the Adaptive Assessment Team detects undesirable system responses. The Refinement Team will have lead responsibility for coordinating the modeling necessary to accomplish system-wide refinements and improvements to the Comprehensive Plan. The Refinement Team will prepare reports on system-wide plan performance in response to each Regional Evaluation Team evaluation report, annual Adaptive Assessment Team report and Model Refinement Team improvements in the performance of the

simulation models. For each Project Implementation Report, the Comprehensive Plan Refinement Team will prepare documentation of predicted system-wide responses, and recommended revisions to the Comprehensive Plan to be included in the Implementation Report.

*Maintain Current Version of Comprehensive Plan and Without-Project Conditions* - As projects are implemented and activities that affect the Comprehensive Plan or the assumptions of the without-project condition occur, the team will keep track of these changes and ensure that all RECOVER and project teams have the most current versions.

#### **4.5 Model Development and Refinement Team**

The Model Development and Refinement Team will be charged with the overall task of ensuring the quality of the predictive models used to conduct the evaluations of Comprehensive Everglades Restoration Plan components, and coordinating the model runs for evaluating alternative plans and refining the Comprehensive Plan.

*Model Development and Refinement* - Many predictive scientific and engineering models that simulate the way that physical and living systems operate were used in developing the Comprehensive Plan. These tools are state-of-the-art, and represent the best understanding of the hydrology of both the pre-drainage and current C&SF system (Natural System Model and South Florida Water Management Model) as well as species and community responses to hydrology (Across Trophic Landscape System Simulation and Everglades Landscape Model). But by their very nature, models are uncertain, as they are simplifications of reality. The South Florida Water Management Model and the Natural System Model have both undergone many revisions during their original development, partially in response to technical peer review. It is envisioned that this refinement and enhancement of the primary models, as well as the development of new evaluative tools, will continue throughout the course of Comprehensive Plan implementation.

The Model Development and Refinement Team will oversee physical, water quality and ecological simulation models and will coordinate the resolution of any technical issues pertaining to the models. Any necessary refinements or enhancements of system-wide models (e.g., the South Florida Water Management Model) will also fall under the team's purview. These tasks require that the models be reviewed on a regular basis. The base condition for the models must be continually adjusted as infrastructure and operational changes occur in the C&SF system. Accurate simulation of projects that are scheduled for later years in the implementation of the Comprehensive Plan will require inclusion of features which will, by that time, be recently constructed and operated. The South Florida Water Management Model will be periodically re-calibrated by extending the period of record. Additionally, this team will identify the need for new model development, and will coordinate the actions necessary to accomplish these tasks.

Coordinate Model Runs for Plan Evaluations - The Model Development and Refinement Team will have the lead responsibility for coordinating any modeling needed to evaluate the potential performance of a restoration project. In addition, the team will coordinate modeling necessary to predict the system-wide responses as each project is implemented and as improvements are made in the models and performance measures.

#### **4.6 Operations Planning Team**

The Operations Planning Team will have the lead role for designing, coordinating and resolving system-wide operational strategies and issues associated with the implementation of the Comprehensive Plan.

Develop Strategy for Project Operational Criteria - The team will be responsible for developing a strategy for ensuring that operation of the components of the Comprehensive Plan will provide the expected benefits to the natural system and to the agricultural and urban sectors. This strategy will guide the Operations Team in working with the Project Delivery Teams in the design of operational criteria for each of the Comprehensive Plan components.

Interim System-Wide Operations - The implementation of the Comprehensive Plan over several decades will result in an evolution of system-wide water patterns, moving from current, base line patterns to the eventual target conditions. Throughout the implementation period, the Adaptive Assessment Team will be assessing how closely the water patterns meet restoration and other water resource-related targets. Construction of new projects will occur incrementally. With each increment or project coming on line, new operational schedules will have to be developed not only for that particular increment but also for those parts of the system that may be affected by the new project. The target conditions for water storage and delivery capacities will only come fully on line toward the end of the program. Interim water patterns may not always be optimum, given the projects in place at any point during implementation. System-wide water patterns will be continually assessed for opportunities to make changes in operational criteria that would improve overall plan performance and to resolve any problems that may arise as the Comprehensive Plan is being implemented. The team will recommend and track changes in interim operational criteria wherever these changes may provide enhancements in the performance of the plan prior to the time when all components are in place.

### **5.0 Public Outreach**

Due to the high public, political and media interest in the restoration of the south Florida ecosystem, public outreach is a critical component of the implementation effort. Public outreach and its three primary components, involvement, information and coordination and will continue to play a key role in restoration implementation.

The primary objectives of the program-level public outreach activities are 1) keep the public informed of the status of the overall program and the key issues associated with restoration implementation; and 2) provide effective mechanisms for public participation in restoration plan development.

The overall public outreach program will be guided by a management plan that will be developed by the Corps and the SFWMD during the first quarter of FY2001. The management plan will provide a framework to link all of the elements of outreach into a coordinated set of activities that are fully integrated with the planning and implementation of Comprehensive Plan projects.

Only program-level public involvement and outreach tasks are described in this section. Project specific public involvement and outreach activities that will be conducted for specific Project Implementation Reports will be described in the Project Management Plan for that project.

*Develop and Update Management Plan for Public Outreach* - A detailed management plan for public outreach at the program level will be developed and updated as necessary. The plan will include all elements relating to public involvement and information such as public input and information, stakeholder and public outreach, education, communications and media. The plan will describe what needs to be done, how it will be done as well as the costs, schedules, milestones and agency responsibilities for completing the activities.

## **5.1 Public Involvement**

Public involvement is the key mechanism by which information is gathered from people. Inherent in the process of public involvement is the provision of some degree of information. Involvement of the public in program-level activities is generally crafted to engage two types of publics 1) stakeholders and interest groups; and 2) the general public.

During the feasibility phase of the Restudy, a third segment of the public was identified as requiring special outreach efforts. The Restudy Minority Outreach Program focused on the region's African-American and Hispanic communities. Efforts to reach and engage the minority communities of south Florida will continue as part of the program-level activities.

*Stakeholder Group Activities* - There are specific stakeholder groups that are most interested in and directly affected by restoration efforts. These generally include agricultural, environmental and urban interests. In addition, there are Federal, tribal, state, regional and local governments involved in the restoration effort. A variety of meetings, workshops, briefings and other related activities will be held throughout the

design period of the program such as: stakeholder group meetings, small group meetings, technical workshops and local government briefings.

Public Meetings and Workshops - Periodic public meetings will be included as a key component of the program level public outreach activities. These meetings, aimed at engaging the general public, will be held at main junctures in the implementation process. These meetings will have the purpose of engaging a broader audience than that traditionally defined as stakeholders and interest groups.

Community Meetings - Throughout the design period, opportunities should be developed for the public to obtain information outside the formal public meeting and workshop process. Civic associations, neighborhood associations, universities and environmental groups can provide avenues to provide information as well as enhance community awareness, understanding and support. These meetings are more informal and are targeted toward “preexisting audiences” that allow the program managers to move beyond the large meeting room to more familiar settings.

Minority Outreach - The African-American and Hispanic communities comprise a majority of Miami-Dade County’s population and a significant portion of those of Broward and Palm Beach counties. Activities aimed at informing and involving the minority communities of south Florida will be conducted. Activities will be undertaken to engage urban communities and minority populations in rural areas.

## **5.2 Public Information**

Public information is at the heart of the outreach program. Information is developed and disseminated through a variety of ways. The management plan for public outreach will establish the framework for coordinated actions and information needs. The activities listed in the following paragraphs are representative of the information that is expected to be developed during the design period.

Publications - Materials developed and printed throughout the course of the study will include public notices identifying the purposes and location of workshops as well as fact sheets and/or newsletters.

Slide Shows – Comprehensive Plan slide shows will be developed or updated for public speaking engagements. A specific project module may be inserted into this presentation.

Videos - Broadcast quality videos to describe the project in lay person's terms and address the questions and concerns of the general will be developed.

Exhibits and Displays - Exhibits and other displays on the Comprehensive Plan will be prepared and updated as needed for use at conferences, fairs and other large meetings.

Media - Media activities include news releases and media opportunities. News releases will be issued prior to public meetings and workshops and at other appropriate times to provide an opportunity to hold discussions with interested media representatives and explain the Comprehensive Plan. Visits to editorial boards, appearances on major public affairs programming as well as the development of guest editorials will be part of the campaign to reach the public through media outlets. This will provide an opportunity to further develop the public's understanding of the program. When appropriate to the study process, special in-depth coverage should be sought through the development of special documentary programs with local public radio and television stations.

Environmental Education - In an effort to accomplish wide-ranging community outreach goals, an environmental education program was designed and implemented during the feasibility phase of the Restudy. This effort will continue as a means to inform the public of the status and issues associated with south Florida ecosystem restoration. The basic approach will be to prepare educators to teach about Everglades restoration and associated issues. Elementary and high school curricula were developed and will be updated regularly. Efforts will be continued to distribute materials broadly. Teacher training workshops will be conducted.

Internet Web Site - In order to facilitate communication between team members and to provide the public with information about the program and specific projects, a new web site for the Comprehensive Plan will be established (see Shared Data and Information Network in Volume I, Section 2.2.1.1 of this document.) This web site will be updated and maintained to provide both technical and program information to team members and the public. The web site will include information on the Comprehensive Plan as well as information on specific projects and activities.

### **5.3 Coordination**

Given the complexity of the implementation program, close coordination with the South Florida Ecosystem Restoration Task Force and Working Group, the Governor's Commission for the Everglades and the Joint Legislative Committee on Everglades Oversight as well as the public processes associated with each of these groups is necessary to ensure the program's success. This process will be coordinated with the SFWMD's regional water supply plan advisory committees as well.

South Florida Ecosystem Restoration Task Force and Working Group – Federal, state, tribal and local government agencies involved in the south Florida ecosystem restoration effort are represented on the South Florida Ecosystem Restoration Task Force. The Federal agencies include the Departments of Interior, Commerce, Army, Justice, Transportation and Agriculture, and the Environmental Protection Agency. Tribal representatives include the Seminole Tribe and the Miccosukee Tribe of Indians. State agencies include the Office of the Governor, the Florida Department of Environmental Protection and the South Florida Water Management District. The

Task Force also includes two representatives of local government. The Task Force established a local-level "Working Group" consisting of Florida-based representatives of the same agencies noted above. Throughout the duration of implementation activities, the Task Force and Working Group will be utilized as a means to provide information to those entities as well as to the general public, non-governmental and governmental organizations and interest groups.

Governor's Commission for the Everglades - On June 24, 1999, Governor Jeb Bush created the Governor's Commission for the Everglades through Executive Order 99-144, as amended. The Commission's charge is to serve as a forum for improving decision-making and public participation in Everglades restoration and south Florida economic and community sustainability, evaluate and make recommendations on the funding and implementation of the Comprehensive Plan, consider the needs of rural and low income communities as Everglades restoration progresses, and recommend actions to better integrate land, water and transportation planning for the south Florida region. This commission consists of business, agriculture, government, public interest and environmental organization representatives. Program managers and Comprehensive Plan team members will brief the Commission, as appropriate, and will assist the Commission in the technical aspects of those projects related to the Commission's charge.

SFWMD Governing Board - As the non-Federal sponsor of the C&SF Project and as the state governmental body charged with water resource management in south Florida, the SFWMD's Governing Board provided policy guidance during the feasibility phase of the Restudy. The Governing Board will continue to do so throughout the implementation phase of the program. Regular updates on the program will be given to the Governing Board at its workshops and/or meetings.

SFWMD Regional Water Supply Advisory Committees - The regional water supply plan advisory committees (Lower East Coast, Upper East Coast, Lower West Coast, and Kissimmee), which were established to assist the SFWMD in the preparation of regional water supply plans, will be consulted with as projects are formulated in the specific geographic areas. Coordination with other committees such as the Northwest Dade County Freshwater Lake Implementation Committee will also occur on a regular basis.

Joint Legislative Committee on Everglades Oversight - The Florida Legislature has designated the Joint Legislative Committee on Everglades Oversight as the Florida legislative entity charged with reviewing implementation of the Comprehensive Plan. Comprehensive Plan program managers will brief the Committee and provide necessary assistance to the Committee as it carries out its responsibilities.

## **6.0 Socioeconomic and Environmental Justice Studies**

Implementation of the Comprehensive Plan will affect the entire region economically and socially. Although the Restudy feasibility report found that the Comprehensive Plan would have an overall positive economic effect on the region, there is the potential for some local areas to be negatively impacted. In particular, the conversion of land from agriculture to water storage in the rural areas surrounding Lake Okeechobee could eliminate the jobs of the individuals who are employed in the affected area and have adverse effects on local communities and economies. Environmental justice involves identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of activities on minority and low-income populations. In addition, opportunities for economically and socially disadvantaged individuals and communities in urban areas of south Florida to participate in project implementation should be a goal of the implementation program.

Although each Project Implementation Report effort will involve a number of socioeconomic and environmental justice analyses and tasks and the preparation of the appropriate National Environmental Policy Act document, there is a need to conduct program level analyses to assess regional effects and needs. The program level socioeconomic and environmental justice studies will be guided by a management plan that will be developed by the Corps and SFWMD and updated as necessary. The management plan will provide a framework to link all of the elements of socioeconomic and environmental justice studies into a coordinated set of activities that are fully integrated with the planning and implementation of Comprehensive Plan projects.

*Develop and Update Socioeconomic and Environmental Justice Studies Management Plan* – A detailed management plan for program-level socioeconomic and environmental justice studies will be developed and updated as necessary. The plan will be used to guide these program-level activities. It also will describe what needs to be done and how it will be done as well as the costs, schedules, milestones and agency responsibilities for completing the activities.

### **6.1 Socioeconomic and Environmental Justice Activities**

As a first step toward integrating societal and economic goals into restoration planning, monitoring, and adaptive management strategies, the South Florida Ecosystem Restoration Working Group charged its Science Coordination Team with understanding the need for and developing a plan for social science input into the restoration process. A symposium process was designed to help develop an “Action Plan” for social science research and the application of social science methods into the restoration process. As the result of the symposium and further analysis by agency social science experts, a “South Florida Action Plan for Applied Behavioral Sciences” dated November 9, 1999 was developed. The Action Plan describes applied behavioral science activities grouped generally under the themes of agriculture, demographics and community studies, the economic benefits of ecosystem restoration, planning and environmental justice and



public outreach. The Action Plan will be developed into a management plan that will fully describe how the following components will be managed.

The Action Plan may serve as a guide for the types of activities that will integrate cultural, social and economic concerns into the decision-making process for the ecosystem restoration effort and provide assessments and data necessary for implementation of the Comprehensive Plan. These types of activities are described in this section as program-level activities.

*Agriculture* - These types of activities could consider the policy options available that are directly designed to enhance natural system restoration and those that currently exist, which influence the agricultural economy of south Florida, examining the potential impact of policy options on agricultural production, changes in the cost of production, farm labor issues and the potential for agricultural relocation. Activities could also be conducted to address the socioeconomic impact of potential land-use changes on the local tax structure and rural infrastructure and what bearing that may have on the acceptability of a given Comprehensive Plan project.

Land acquisition alternatives for specific key areas in south Florida and their trade-off in terms of cost-effectiveness to the larger ecosystem of acquiring particular land tracts could be explored. A cost effectiveness analysis of the various acquisition options may assist program managers to select land acquisition options according to their cost effectiveness and budgetary requirements.

Understanding the complex relationship between water availability, price and usage rates is critical information. Existing static economic models project future water demand based on current consumptive usage rates and agricultural land use patterns. These projections may overestimate future shortages and lead to wide spread misconceptions regarding the magnitude of conflicting water demands between agricultural, municipal and industrial as well as natural system requirements. Relevant and appropriate models could be adapted to south Florida conditions and be used to assess alternative water supply/allocation policies.

*Demographics and Community Studies* - Population, land use and water demands are the major driving forces behind south Florida's present and future resource needs. Restoration efforts require reliable and valid baseline information about these parameters while restoration, water supply or other planning or implementation projects are being developed for regional or sub-regional scales. Projecting these parameters is an uncertain process that needs updating and sensitivity analyses to provide the best input to planning and restoration activities.

Community studies could target understanding the socioeconomic issues and needs of urban and rural areas in south Florida by inventorying community-identified social, cultural and natural places with historic significance. Long-term ethnographic techniques could establish community uses of the environment, leadership patterns of neighborhoods and document informal economic activities. By developing

community indicators, the positive and negative impacts of restoration projects, with particular emphasis on vulnerable populations, can be monitored.

*Economic Benefits of Natural System Restoration* - Environmental and economic benefits of restoration may be determined for selected restoration projects, including benefits for recreation and tourism as well as other commercial and employment opportunities.

*Planning and Environmental Justice* - Modifications of the Central and Southern Florida Project to achieve ecosystem restoration will result in a wide array of benefits and costs. Some of the costs may translate into potentially adverse health, social and economic effects. In addition, the beneficial and adverse effects of restoration alternatives may have disproportionate impacts on minority and low-income populations. These types of planning and environmental activities could identify minority and low-income populations potentially affected by ecosystem restoration; assess potential beneficial and adverse health, social, and economic effects on these vulnerable groups; and develop and implement an environmental justice program to maximize beneficial effects and minimize and mitigate disproportionate negative environmental, health and socioeconomic effects on these groups.

## **6.2 Programs for Socially and Economically Disadvantaged Individuals**

The private sector will be involved in the planning, design and construction of the features of the Comprehensive Plan. This involvement includes technical and professional services as well as construction. Outreach efforts will be conducted to engage small businesses, minority and women-owned businesses as well as disadvantaged businesses. Mechanisms for conducting outreach include:

- Participation in outreach events conducted by others for the purpose of involving local small business, small disadvantaged business, women-owned small business and Housing Urban Development Zone small business concerns.
- Hosting outreach events for the purpose of involving local small business, small disadvantaged business, women-owned small business and Housing Urban Development Zone small business concerns and providing details on upcoming projects.

Outreach events can consist of, but are not limited to, trade fairs, conferences, workshops and speaking engagements. Events should be coordinated with local chambers of commerce, professional organizations, the U.S. Small Business Administration and other appropriate entities.

*Develop Socially and Economically Disadvantaged Individuals Plan* - A plan will be developed to ensure that socially and economically disadvantaged individuals and communities are provided with opportunities to participate as a small business

concern contractor and given opportunities for employment or internships in emerging industry sectors. The plan will also include goals.

Promote Work Force Training - Efforts will be made to ensure workforce development through universities, community colleges and skill training programs. This will help ensure that the residents of the communities have the necessary skills for employment.

## **7.0 Other Program Level Activities**

During the development of the Comprehensive Plan, the Restudy Team evaluated the 1996 list of Critical Restoration Projects developed by the South Florida Ecosystem Restoration Working Group to determine whether these projects should be included in the Comprehensive Plan. Most all of the construction projects were included in the Comprehensive Plan as “Other Project Elements.” Some projects that were more study-oriented or involved implementation of monitoring infrastructure were recommended for implementation as part of the pre-construction engineering and design phase.

These projects, including the two summarized below, will be evaluated during FY2000 to determine, considering current technology and data needs, whether they are critical to implementation and monitoring of the Comprehensive Plan. If this preliminary evaluation determines that these projects are critical to implementation of the Comprehensive Plan, then the Corps and SFWMD will establish an interagency team to develop a project management plan for each projects. These project management plans will include a detailed description of the scope, including a description of the methodology and equipment to be used, as well as a summary of agency responsibilities, schedules, milestones and cost estimates for completing the projects.

Geodetic Vertical Control Surveys - There is a need to resolve elevation discrepancies in south Florida. Uncertainties even in tenths of a foot in as flat a terrain as south Florida, can lead to a gross miscalculation of water budgets and discharges as well as distortions of critical hydrologic variables. As an indication of the critical nature of this need, it has been observed that the Everglades has elevation changes as low as one-tenth of a foot over 10 miles. Not only is sound accurate scientific data needed for the analysis and design of restoration projects, but it is also critical in the future acquisition of data, essential to monitoring the success of all restoration efforts in south Florida.

Elevations used to describe water levels throughout the SFWMD are derived from monuments set in the ground, which have been assigned an elevation based on measurements against a vertical datum. There are two datums currently in use in south Florida, the National Geodetic Vertical Datum of 1929 (NGVD-29) and the North American Vertical Datum of 1988 (NAVD-88). The SFWMD and the Corps Jacksonville District currently register water elevations relative to the NGVD-29 datum. In June 1993, the Federal government announced a decision to use the NAVD-88 as the standard for all federal projects and as the official civilian vertical datum for surveying

and mapping activities in the United States that are performed or financed by the Federal government. Since this announcement, each Federal agency has been asked to develop policies to transition to the new datum. These policies have resulted in the National Oceanographic and Atmospheric Association (NOAA) and the U.S. Geologic Survey (USGS) discontinuing the use and support of the NGVD 29 datum and the Corps adopting a policy to survey all new projects in the new datum.

Preliminary communications between technical from the Corps, SFWMD and Florida Department of Environmental Protection have confirmed the critical nature of these data for the Comprehensive Plan. If a decision is made to complete an NAVD-88 geodetic survey control network, the Corps and the SFWMD will establish an interagency team to develop the network and prioritize the individual runs so that the data for areas where early project implementation will occur (e.g., the 10 initial authorization projects) are generated first. A detailed project management plan will be completed in FY2000 that defines the scope and priorities, schedules and milestones, agency responsibilities and cost estimates.

*Six Permanent Water and Meteorological Stations* – This critical project involved establishing six new permanent meteorological and water-level measuring stations in the Everglades and Biscayne Bay National Parks region to support hydrologic modeling and monitoring needs. In addition to collecting water levels, all of the units would collect backup water levels (storm surge), wind speed and direction, rainfall, barometric pressure, air and water temperature, relative humidity, solar radiation and salinity. All data would be transmitted from the field units to the Florida Department of Environmental Protection for data analysis via Geostationary Operational Environmental Satellite (GOES).

The Corps and SFWMD staff has not yet completed an evaluation of the criticality of this project to the Comprehensive Plan. The RECOVER Team will be requested to evaluate the need for these new stations and, if needed, to provide some guidance on the actual number and locations for these stations. This evaluation will be completed by September 30, 2000 and if the project is determined to be critical to the Comprehensive Plan, a detailed management plan will be completed during the first quarter of FY2001.

## **APPENDIX G**

### **Outline for Master Program Management Plan Volume II: Annual Report and Work Plan**

This appendix provides an outline and content for Volume II of the Master Program Management Plan - the Annual Report and Work Plan. This outline and discussion is provided as a general guideline and may be modified as needed.

#### **1.0 Introduction**

Since this will be a stand-alone document, this section should provide a brief introduction that describes the objectives of the Comprehensive Plan.

#### **2.0 Purpose of the Master Program Management Plan**

This section should provide a brief review of the purpose for the Plan and the general composition of Volumes I and II. It should be noted that Volume II will be used by the Corps and the SFWMD to develop their upcoming fiscal year budget requests. It should also be noted that the Jacksonville District Engineer's approval of Volume II fulfills the requirements of Section 208 of the Water Resources Development Act of 1999 for authorizing the SFWMD to perform in-kind work for credit against its share of the design effort.

#### **3.0 Accomplishments**

This section should include a summary of the major accomplishments and developments related to implementation of the Comprehensive Plan that have occurred during the past year. For ease of reading and brevity, accomplishments should be highlighted by a series of bullet statements that capture the essence of the accomplishment or development. If accomplishments are numerous, it is recommended that they be divided under appropriate headings such as Legislative Developments and impacts, Restoration Coordination and Verification, Public Outreach and Education, etc.

#### **4.0 Program Implementation Schedule**

This section will provide an explanation of the consolidated roll-up of the management plans developed for the individual projects/programmatic activities that comprise the Program Implementation Schedule. It also will include a summary of any major changes made to the Program Implementation Schedule since the last update of the Master Plan. This section should reference Appendix A, which includes the updated Program Implementation Schedule – the consolidated roll-up of project-level and program-level activity schedules.

## **5.0 Work Planned for Program-Level Activities**

This section should provide a product-oriented discussion of the work planned for the current year and the upcoming two fiscal years. It should be subdivided so that the subsections track the categories of program-level activities described in Appendix F. The following subsections may be common from year to year but can change with future updates:

- 5.1 Program Management and Technical Coordination
- 5.2 Updating the Master Plan and Program Implementation Schedule
- 5.3 Restoration Coordination and Verification Activities
- 5.4 Public Outreach Activities
- 5.5 Socioeconomic and Environmental Justice Activities
- 5.6 Program Controls Activities

Section 5.0 also should include a table that shows a breakout of cost estimates for the current fiscal year and upcoming two fiscal years for each of the general categories of program-level activities. Whenever practicable, cost estimates should be broken out for the Corps and SFWMD to reflect the division of responsibilities for these activities.

## **6.0 Work Planned for Project-Level Activities**

This section should include a summary of project-level activities to be completed over the upcoming two years. Starting in FY2001, this can be accomplished by developing a series of tables showing a list of projects for which a major design plan or product will be completed, along with scheduled completion dates. Summary tables to consider are:

- List of projects for which Project Management Plans will be underway in the next two years
- List of projects for which Project Implementation Reports will be underway within the next two years
- List of projects for which Design Documentation Reports will be underway within the next two years
- List of projects for which Plans and Specifications will be underway within the next two years

Section 6.0 should also include a table summarizing cost estimates for each project for the current fiscal year and the upcoming two fiscal years. These cost estimates should be subdivided to reflect the relative Corps and SFWMD responsibilities and cost-share for each project.

## **7.0 Project Summaries**

This section should reference Appendix B where the two-page project summaries are found.

## **8.0 Refinements to the Comprehensive Everglades Restoration Plan**

As implementation progresses, there will be refinements to the Comprehensive Plan based on RECOVER evaluations and recommendations. This section would be used to highlight the more significant refinements made to the Comprehensive Plan during the past year.

### **Appendices**

#### **Appendix A – Program Implementation Schedule**

This appendix will include the consolidated roll-up of project-level and program-level activity schedules.

#### **Appendix B – Project Summaries**

This appendix will include a two-page project summary for each project that is currently under way or will be initiated within the upcoming two years. The format and content of project summaries may evolve over time, but will continue to include the following information:

- Brief description of the project and project purpose
- Summary of the Corps and SFWMD responsibilities for the project design phase
- Project schedule, along with a list of major milestones and target completion dates
- Actual expenditures to date and a five-year projection of costs for design, real estate and construction

Figure B-1 illustrates a draft template for the project summaries.

<b>PROJECT TITLE:</b>	
<b>LEAD AGENCY:</b>	<b>AUTHORIZATION:</b> <b>State:</b> <b>Federal:</b>
<b>PROJECT MANAGERS:</b> USACE: SFWMD:	<b>DATE PMP APPROVED:</b>
<b>COUNTIES:</b>	<b>DATE PROJECT SUMMARY SHEET LAST REVISED:</b>
<b>PROJECT DESCRIPTION:</b>	
<b>AGENCY RESPONSIBILITIES:</b>	

Project Schedule										
Phase	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	Continues
Planning, Engineering & Design										
Real Estate										
Construction										

**Figure B-1**  
**Project Summary Sheet**



Budget Estimates (In Thousands of Dollars)								
Phase	Thru FY99	FY00	FY01	FY02	FY03	FY04	Balance	Total
Planning, Engineering and Design								
Real Estate								
Construction								
<b>Fiscal Year Total</b>								

Project Milestones		
Milestone	Target Completion Date	Actual Completion Date
Project Management Plan Approved		
Draft PIR and Supplemental NEPA Completed		
PIR Approval		
Record of Decision		
Project Authorizations		
Detailed Design Completed		
Construction Initiated		
Construction Completed		

**Figure B-1**  
**Project Summary Sheet**

AUGUST 2000

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# **MASTER PROGRAM MANAGEMENT PLAN VOLUME II – ANNUAL REPORT AND WORK PLAN**

## **COMPREHENSIVE EVERGLADES RESTORATION PLAN**



U.S. Army Corps of Engineers  
Jacksonville District



South Florida  
Water Management District

# **Master Program Management Plan**

## **Volume II – Annual Report and Work Plan**

### **August 2000**

## **1.0 Introduction**

The “Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement” completed in April (April 1999 Final Feasibility Report) recommends a comprehensive plan for the restoration, protection and preservation of the water resources of central and southern Florida, including the Everglades. This plan is known as the Comprehensive Everglades Restoration Plan (Comprehensive Plan). One of the primary objectives of the Comprehensive Plan is to increase water supply for the natural system as well as for urban and agricultural needs. In addition to increasing water supplies, the Comprehensive Plan will restore more natural flows of water, including sheet flow; improve water quality; and establish more natural hydroperiods in the south Florida ecosystem. Improvements to native flora and fauna, including threatened and endangered species, will occur as a result of the restoration of hydrologic conditions. Hydrologic restoration and water quality improvement will be accomplished by:

- Capturing approximately 1.7 billion gallons per day of water that is currently discharged to the Atlantic Ocean and Gulf of Mexico
- Constructing approximately 181,300 acres of surface water storage reservoirs with the capacity to store 1.5 million acre-feet of water
- Establishing approximately 300 aquifer storage and recovery wells with a capacity of storing 1.6 million gallons per day of water
- Constructing approximately 35,600 acres of wetland-based treatment systems to improve water quality
- Removing more than 240 miles of levees and canals to re-establish natural sheet flow through the Everglades
- Constructing two advanced wastewater treatment plants in Miami-Dade County capable of cleaning more than 220 million gallons per day of the county’s treated wastewater for discharge to Biscayne Bay and recharging the Biscayne aquifer.

## **2.0 Purpose of the Master Program Management Plan**

The purpose of this Master Program Management Plan (Master Plan) is to describe the framework, processes and protocols to be used by the U.S. Army Corps of Engineers (Corps) and the South Florida Water Management District (SFWMD) while implementing the portions of the Comprehensive Plan covered by the Design Agreement executed between the SFWMD and the

Secretary of the Army on May 12, 2000. In addition, the Master Plan will provide an updated summary of the project descriptions, schedules, milestones, and cost estimates for implementing the Comprehensive Plan. For this Master Plan the term program refers to the Comprehensive Plan projects for which the SFWMD is the local sponsor.

The Master Plan is divided into two volumes. Volume I, Management Processes, includes a background and overview of the program; a description of management processes and protocols to be used by the Corps and SFWMD for implementing the Comprehensive Plan; a description of products and approval authorities necessary for project development; and a summary of program-level activities and tasks – those that are not specifically linked to a particular project. Volume II, the Annual Report and Work Plan, includes a summary of major accomplishments during the past year and work planned for FY2000 through FY2002. It also provides a summary of program-level activities and tasks planned for FY2000 through FY2002, products to be completed and gross cost estimates. Cost estimates and schedules for program-level activities will be more fully developed in the next update of Volume II based on information from detailed management plans that will be prepared for each of the program-level activities.

This first version of Volume II includes only limited information for project-level activities, schedules and costs. More detailed information will be included in future versions of Volume II after the program implementation schedule is updated, Project Management Plans have been developed for individual projects and management plans have been developed for program-level activities. A full version of Volume II, as outlined in Appendix G of Volume I, will be completed in November of each year. The November Volume II update will include a summary of major accomplishments for the prior fiscal year, and a summary of work planned for the upcoming two years. It also will include two appendices. Appendix A will provide an updated program implementation schedule showing the consolidated roll-up of schedules and milestones for program-level and project-level activities. Appendix B will include a two-page summary for each ongoing project and each project that will be initiated within the upcoming two fiscal years. Each project summary will include a brief description of the project; the responsibilities of each agency during the design phase of the project; an updated schedule and milestones; and a cost estimate for completing the project.

In April of each year, the two Volume II appendices will be updated to reflect the latest schedules, milestones and cost estimates based on development and revision of management plans for individual projects and program-level activities. Draft versions of these appendices will be completed by March 1 of each year to help guide the SFWMD in developing its upcoming fiscal year budget request. By April 15, a final version will be completed that incorporates actual expenditures through the end of the second quarter of the current fiscal year. This version will be used to refine the SFWMD's budget request and support the Corps' budget update.

### **3.0 Accomplishments**

The "Central and Southern Florida Project Comprehensive Review Study Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" was completed in April

of 1999 and submitted to Congress on July 1, 1999. Since that time, there has been a great deal of activity on many fronts related to the Comprehensive Plan. The U.S. Congress and Florida Legislature have taken a keen interest in the Comprehensive Plan; numerous hearings and briefings have occurred during the past year. New legislation has been passed and still more is being drafted. The Corps and the SFWMD have continued planning for implementation, continued related feasibility studies in the Water Preserve Areas and Indian River Lagoon, and initiated development of the scope for a feasibility study in southwest Florida. This section briefly summarizes a few major developments and accomplishments that have occurred in the past year.

- The Florida Legislature passed the Restudy Bill (Senate Bill 1672) in April 1999, which was later codified in Sections 373.1501 and 373.026 of the Florida Statutes. The Restudy Bill authorizes the SFWMD to 1) be local sponsor on projects included in the Comprehensive Everglades Restoration Plan; 2) continue monitoring, research, pre-construction engineering and design for projects included in the Comprehensive Plan; and 3) construct pilot projects that will assist in determining the feasibility of technologies included in the Comprehensive Plan. The Restudy Bill also establishes a process and guidelines for the SFWMD to follow for projects that are not yet authorized.
- Congress passed the Water Resources Development Act of 1999 in October 1999. This act authorized construction of two pilot projects - the Lake Okeechobee Aquifer Storage and Recovery Pilot Project and the Hillsboro Site 1 Aquifer Storage and Recovery Pilot Project. The act also authorized the Secretary of the Army to allow the non-Federal sponsor to be credited for work completed at the request of the Secretary in furtherance of the design of projects included in the Comprehensive Plan.
- The Corps executed Project Cooperation Agreements for nine critical restoration projects with a total cost of \$150 million (50 percent Federal) authorized in the Water Resources Development Act of 1996. Several of these projects were included as part of the original Comprehensive Plan but this act allowed the Corps to expedite implementation to provide near-term benefits for the ecosystem.
- The Florida Legislature passed House Bill 221 leading to the Everglades Restoration Investment Act in May 2000. This act commits Florida to contributing over \$2 billion, which fulfills the state's share of the first 10 years' cost for implementing the Comprehensive Plan. The bill requires that before executing a Project Cooperation Agreement with the Corps for construction of a project, the SFWMD and the Corps must first complete a Project Implementation Report to address the project's economic and environmental benefits, engineering feasibility and other factors outlined in Section 373.1501 of the Florida Statutes.
- The Florida Legislature passed the Lake Okeechobee Protection Program (House Bill 0991) in May 2000 and appropriated \$38.5 million to expedite the Lake Okeechobee restoration effort. Approximately \$8 million of this appropriation was earmarked to buy lands needed for implementation of projects included in the Comprehensive Plan.

- The Corps and the SFWMD executed a Design Agreement on May 12, 2000 that covers approximately \$712 million worth of design work on the Comprehensive Plan. The Design Agreement covers all aspects of design for six pilot projects and 56 of the 68 components included in the Comprehensive Plan as well as program-level activities necessary to manage, coordinate and monitor the design program.
- The Corps and the SFWMD completed development of this Master Plan in August 2000. The Master Plan provides the framework, processes and protocols for managing, coordinating, and monitoring implementation of the Comprehensive Plan.

## **4.0 Work Planned for Program-Level Activities**

In this Master Plan, work descriptions have been separated into project-level activities and program-level activities. Project-level activities include planning, engineering, design and project management activities that are specific to an individual project. Project-level activities will be described, scheduled and cost-estimated in an individual Project Management Plan for each project. Program-level activities are more system-wide in nature, addressing many or all of the projects covered under the Design Agreement. Examples of program-level activities include program management and technical coordination, Restoration Coordination and Verification (RECOVER), public outreach, socioeconomic and environmental justice studies, and program controls.

Descriptions of the objectives, processes and strategies for accomplishing program-level activities are provided in Volume I (Sections 2, 3 and Appendix F) of the Master Plan. This section provides a brief summary of the specific work planned and products projected for completion during Fiscal Years 2000 through 2002, along with estimated costs (Table 4-1) for completing these program-level activities. The cost estimates provided in Table 4-1 are gross estimates at this time. These estimates will be revised in future updates of Volume II based on additional planning and analyses during the development of detailed management plans for the program-level activities.

### **4.1 Program Management and Coordination**

Program management and technical coordination activities during FY2000 through FY2002 will include the following:

- Staff and resource planning
- Coordination and communications with Corps higher authority and the SFWMD Governing Board
- Coordination of the Comprehensive Plan activities with other ongoing restoration projects and programs
- Design Coordination Team work
- Development and delivery of legislatively mandated reports
- Briefings for Congressional and Florida Legislature committees and staff

- Partnering and teambuilding workshops and activities
- Training for implementation of the Comprehensive Plan
- Coordination with interagency and stakeholder groups such as the South Florida Ecosystem Restoration Task Force and Working Group and the Governor's Commission for the Everglades.

## **4.2 Master Program Management Plan and Program Implementation Schedule Updates**

A conceptual-level program implementation schedule was developed and included in Chapter 10 and Appendix M of the April 1999 Final Feasibility Report. This program implementation schedule represented the best professional judgement and available knowledge regarding technologies to be employed and availability of lands at the time of completing the Comprehensive Plan. The sequencing and scheduling of components were based on several key assumptions. For example, it was assumed that future Congressional authorizations would occur on a schedule that would not impact project sequencing and scheduling. Included in this assumption was the expectation that the Water Resources Development Act of 2000 would include the initial authorization package recommended in the April 1999 Final Feasibility Report. The report recommended that the initial authorization package authorize the Corps to construct the remaining four pilot projects (two pilot projects were authorized in the Water Resources Development Act of 1999) and 10 of the restoration projects. The report also recommended that the Water Resources Development Act of 2000 authorize the Corps to implement 27 projects valued at less than \$70 million under a streamlined programmatic authority similar to the Critical Restoration Projects authority provided in the Water Resources Development Act of 1996. If the Water Resources Development Act of 2000 authorization varies from this assumption or if it includes additional requirements and processes that were not anticipated in the April 1999 Feasibility Report, it could impact the proposed program implementation schedule.

The team that developed the initial program implementation schedule also assumed that 1) results of pilot projects and additional studies would not substantially change the Comprehensive Plan; 2) staff and funding would be available from the state and the Corps to implement the Comprehensive Plan at a rate of approximately \$400 million per year; 3) some pilot projects would be started immediately after submission of the Comprehensive Plan to Congress on July 1, 1999; and 4) a Design Agreement would be executed between the Corps and the SFWMD on September 30, 1999. The initial implementation schedule also was based on a number of sequencing and scheduling rules that considered, among other things, interdependencies among projects or components that would require sequential rather than parallel implementation of some projects. For example, the Lake Okeechobee Aquifer Storage and Recovery Pilot Project must be completed before initiating the full-scale Lake Okeechobee Aquifer Storage and Recovery Project.

The Corps and the SFWMD will begin implementation of the Comprehensive Plan projects generally in accordance with the original schedule and cost estimates. However, it is recognized, as it was from the onset, that the schedule and cost estimates will have to be updated regularly based on new developments, knowledge gained from field studies and pilot projects, land

acquisition opportunities, actual appropriation levels, staffing availability, and new state and Federal legislation. The Corps and the SFWMD will be updating the implementation schedule and annual cost estimates during the next several months. Refinements to the schedule and annual cost allocations will consider factors such as 1) recent developments that may accelerate or delay start dates for some projects – such as the additional time required to develop, negotiate and approve the Design Agreement and the Master Plan; 2) the additional coordination and approval requirements mandated by the 1999 Florida Restudy Bill (Chapter 373.1501 Florida Statute); 3) funding commitments made by state and Federal appropriations; 4) authorizations and requirements included in the Water Resources Development Act of 2000, if enacted; 5) a thorough review of the logic and interdependencies among the projects and components; 6) consideration of opportunities to accelerate projects that will have significant near-term benefits to the Everglades; and 7) adjustments resulting from a more thorough project planning analysis made during development of a Project Management Plan for each project.

Completion of the updated program implementation schedule is targeted for January 2001 so that it can be included in the first version of the Volume II appendices targeted for completion in April of 2001. This timeframe will allow the new schedule to consider the results of the Water Resources Development Act of 2000 (if enacted), the President's FY2002 budget, the SFWMD's FY2001 budget appropriations for implementation of the Comprehensive Plan, management plans for program-level activities and Project Management Plans for individual projects completed before January. The Corps and the SFWMD will provide opportunities for agency, stakeholder and public input during this period.

### **4.3 Restoration Coordination and Verification Activities**

The Restoration Coordination and Verification (RECOVER) task teams were organized between January and July of 2000. During the remainder of FY2000, RECOVER efforts will focus on the production of the following:

- White paper describing the Adaptive Assessment Strategy
- Official list of hydrological, water quality and biological performance measures for the Comprehensive Plan
- Evaluation report describing the predicted system-wide responses for the projects developed in the Water Preserve Areas Feasibility Study
- Report describing a recommended list of system-wide hydrological indicators of plan influences on regional hydropatterns
- Baseline report describing the key indicators of success for the Comprehensive Plan – those criteria that will allow measurement of how well the implementation effort is meeting its restoration and water supply targets
- Management plan describing the scope, schedules, costs and agency responsibilities for the development of a system-wide data management

For FY2001, RECOVER efforts will focus on completion of:



- Report describing a refined set of system-wide performance measures and a recommended, system-wide monitoring and data management program to measure the success of the Comprehensive Plan
- Revised report on the conceptual ecological models that are used as the basis for the performance measures and monitoring program
- Revised baseline report on key indicators of success
- Evaluation report on the predicted system-wide responses to projects developed in the Indian River Lagoon Feasibility Study
- Upgrade to the South Florida Water Management Model to year 2000 data
- Evaluation reports for each of the Project Implementation Reports completed during the year
- Report recommending research priorities in support of the Comprehensive Plan monitoring program
- Design and implementation of the data management program to support system-wide monitoring
- Development of tools to display and analyze the monitoring data in support of adaptive assessment

For FY2002, RECOVER will produce:

- Refined report on performance measures and a system-wide monitoring program; 2) a report recommending refinements to the Natural Systems Model
- Draft Adaptive Assessment Report on system responses
- Evaluation reports for each of the Project Implementation Reports completed during the year
- Reports to the Design Coordination Team on recommended refinements in the Comprehensive Plan
- First annual Report Card on key indicators of the success of the Comprehensive Plan.

In addition, development and enhancement of analytical tools to support adaptive assessment will continue throughout FY2002. The shared data and information network will be expanded as necessary to accommodate the continuous acquisition, collection, storage and publishing of geospatial data in support of the system-wide monitoring program.

#### **4.4 Public Outreach Activities**

A detailed management plan will be developed, and updated as necessary, by the Corps and SFWMD to guide the overall public outreach program. The management plan will include all elements relating to public involvement and information such as public input and information, stakeholder and public outreach, education, communications and media. The plan will describe the tasks to be completed, how the tasks will be completed and agency responsibilities for completing the tasks. It also will include a schedule with milestones and cost estimates for various tasks. Development of this plan will begin in FY2000 and will be completed in the first quarter of FY2001. Implementation of the public outreach plan will begin in the second quarter of FY2001. Public participation will be provided through stakeholder group activities, public

meetings and workshops, community meetings and minority outreach. Information will be provided through the maintenance of Corps and SFWMD internet web sites, publications, slide shows, videos, exhibits and displays, media and environmental education.

#### **4.5 Socioeconomic and Environmental Justice Activities**

A detailed management plan for the program-level socioeconomic and environmental justice activities will be developed by the second quarter of FY2001. The management plan will provide a framework to link all of the elements of socioeconomic and environmental justice studies into a coordinated set of activities that are fully integrated with the planning and implementation of Comprehensive Plan projects. The plan will describe the activities and tasks to be completed and agency responsibilities for completing the work. In addition, the plan will provide a schedule and milestones as well as cost estimates for completing the work. Implementation of the management plan will begin in the second quarter of FY2001. Activities to be completed include agriculture, demographics and community studies; analyses to determine the economic benefits of natural system restoration; and planning, environmental justice and outreach efforts to engage small businesses, minority and women-owned businesses and disadvantaged businesses.

#### **4.6 Program Control Activities**

Management plans for individual program control activities will be completed in the first quarter of fiscal year 2001. The implementation schedules contained in these management plans will provide a detailed breakdown of start dates and interim milestones for each activity and task. Estimated completion dates are as follows:

- Establish a program and project cost accounting system by the end of September 30, 2000.
- Establish a common program scheduling and tracking system by December 31, 2000.
- Establish the basic infrastructure for the shared data and information network by September 30, 2001. This network will be maintained and expanded to meet the needs of the program as necessary.
- Establish and implement a document management and control system by September 30, 2001.
- Establish the standards and common formats necessary to easily share geospatial data by December 31, 2000. Convert geospatial data and models to conform to the established standards by September 30, 2002.
- Implement process improvements and a new real estate data management system by September 30, 2001.

**Cost Estimates for Program-Level Activities\* (in Thousands of Dollars)**  
**Table 4-1**

<b>Activity</b>	<b>FY2000</b>	<b>FY2001</b>	<b>FY2002</b>
Program Management and Coordination	\$400	\$800	\$800
Master Program Management Plan and Program Implementation Schedule Updates	\$150	\$150	\$100
Restoration Coordination and Verification (RECOVER)	\$500	\$10,000	\$10,000
Public Outreach	\$500	\$1,000	\$1,000
Socioeconomic and Environmental Justice Studies	\$50	\$1,000	\$1,000
Program Controls	\$500	\$3,000	\$3,000
Other Program-Level Activities	\$50	\$1,200	\$1,200

\* These are gross cost estimates that will be refined based on detailed management plans to be developed for each activity.

## **5.0 Work Planned for Project-Level Activities**

This section provides a brief description for project-level activities to be completed in FY2000 through FY2002. Future versions of this Annual Report and Work Plan will include more detailed breakouts of project-level activities and cost-estimates based on the updated program implementation schedule and results of the Project Management Plans that are completed for each project.

### **5.1 Development of Project Management Plans**

A Project Management Plan will be prepared for each project prior to initiating design work. As described in Section 4.1 and Appendix B of Volume I, the Project Management Plan will define the scope for the project and will provide a detailed work breakdown structure for designing the project. The plan also will describe Corps and SFWMD responsibilities for various activities and tasks during the design phase, and will provide a detailed schedule and milestones for the project. Depending upon the scope and complexity of the projects, the Project Management Plans will require two to six months to complete. Table 5-1 lists the Project Management Plans that the Corps and SFWMD will be developing during FY2000 through 2002, along with estimated start dates.

**Project Management Plan Development Schedule for FY2000 through FY2002**  
**Table 5-1**

<b>Project</b>	<b>Estimated Start Date</b>
Lake Okeechobee ASR Pilot Project	08/2000
Caloosahatchee River Basin ASR Pilot Project	10/2000
L-31N Seepage Management Pilot Project	09/2000
Hillsboro Site 1 Impoundment & ASR Pilot Project	08/2000
Lake Belt In-Ground Reservoir Pilot Project	09/2000
Wastewater Reuse Technology Pilot Project	10/2000
Lake Okeechobee Watershed Project (A, W, and 2 OPEs)	09/2000
Lake Istokpoga Regulation Schedule Project (OPE)	01/2001
Part 1 – C-43 Basin Storage Reservoir Project (D P1)	01/2001
C-44 Basin Storage Reservoir Project (B)	07/2001
Phase 1 – C-23 & C-24 Storage Reservoir (UU P1)	07/2001
Phase 2 – C-25 & North & South Fork Storage Reservoir (UU P2)	07/2001
Part 1 - Everglades Agricultural Area Storage Reservoirs Project (G P1)	09/2000
Flows to NW & Central WCA 3A Project (II, RR)	09/2000
Loxahatchee NWR WCA 1 Internal Structures Project (KK)	10/2000
Modify Holey Land Wildlife Management Area Operation Plan Project (DD)	10/2000
Modify Rotenberger Wildlife Management Area Operation Plan Project (EE)	10/2000
Part 1 - North Palm Beach County Project (X, Y, K, GGG, LL, Pal Mar, LWL)	09/2000
Acme Basin B Discharge Project (OPE)	07/2001
Protect & Enhance Existing Wetland Systems Adjacent to LNWR (OPE)	07/2001
Part 1 - Hillsboro Site 1 Impoundment Project (M P1)	07/2001
Western C-11 Diversion Impoundment and Canal, WCA 3A/3B Levee Seepage Management and North New River Conveyance Improvements	07/2001
C-9 STA / Impoundment Project (R)	07/2001
Dade-Broward Levee / Pennsuco Wetlands Project (BB)	07/2001
C-4 Control Structure Project (T)	10/2000
Biscayne Bay Coastal Wetlands Project (FF, OPE)	10/2001
C-111N Spreader Canal Project (WW)	10/2000
Southern Golden Gate Estates Restoration Project(OPE)	09/2000
Florida Keys Tidal Restoration Project (OPE)	10/2000

## **5.2 Project Design Activities**

In addition to development of Project Management Plans, work completed during FY2000-2002 will include the preparation of Project Implementation Reports, Pilot Project Design Reports and Design Documentation Reports. A primary focus of the project-level work will involve planning, engineering and general design associated with development of Project Implementation Reports. This project-level design work will be initiated immediately after

approval of a Project Management Plan. Project Implementation Report design work will be conducted for most of the projects in Table 5-1 during FY2000-2002. Exceptions are pilot projects where a Pilot Project Design Report will be prepared instead of a Project Implementation Report and projects where general design is being completed under one of the ongoing feasibility studies.

For the six pilot projects listed in Table 5-1, work on a Pilot Project Design Report will be initiated immediately after approval of a Project Management Plan. For some of the projects included in Table 5-1, the general design work is being completed under the Water Preserve Area Feasibility Study or the Indian River Lagoon Feasibility Study. In those cases, the feasibility report will provide the site-specific design information, analyses and data that will serve as the Project Implementation Report. For these projects, once the feasibility reports are completed and a Project Management Plan is approved, work will be initiated on detailed design.

### **5.3 Project Summaries**

A summary of each project is included in Volume I - Appendix A of the Master Program Management Plan. The April 2001 version of the Volume II appendices will include a two-page summary for each project including the following information:

- Brief description of the project
- Summary of the Corps and SFWMD responsibilities for the project design phase
- Project schedule, along with a list of major milestones and target completion dates
- Actual expenditure to date and a five-year project cost estimates for design, real estate and construction

Volume I - Appendix G of the Master Plan provides a template for the project summaries to be included in future versions of the Annual Report and Work Plan. These project summaries will be updated each year based on developments and accomplishments of the prior year.

## IT Change Control Overview

CERP IT Change Control processes and reviews proposed changes that will affect IT/IM resources located in the CERP Zone network.

Anyone registered in the CERP Directory within [www.cerpzone.org](http://www.cerpzone.org) may submit a request. A weekly IT group meeting is conducted between the U.S. Army Corps of Engineers and the South Florida Water Management District to discuss and facilitate the approval and subsequent execution of submitted requests. [Barbara Burch](#) (USACE) and [Bill Hall](#) (SFWMD) are the designated approvers for all requests.

### Meeting Time and Location

Every Monday at 10:30am

SFWMD - B2 1SE - Loxahatchee

USACE - Barbara Burch's Office (Prudential Building, 5W)

### Contacts

Barbara Burch, [Barbara.J.Burch@saj02.usace.army.mil](mailto:Barbara.J.Burch@saj02.usace.army.mil)

Bill Hall, [bhall@sfwmd.gov](mailto:bhall@sfwmd.gov)

**CERPZone Information Technology Program**  
**Standard Operating Procedures – Weekly Teleconference**

1. Every Monday, from 1000-1100 hrs, the participating Information Technology staff of the Jacksonville District (CESAJ), South Florida Water Management District (SFWMD) and associated contractors will conduct a teleconference to openly discuss and share important information, actions and activities concerning automation support to the Comprehensive Everglades Restoration Plan (CERP). Specific teleconference discussion would include the following:
  - General project/program information
  - Calendar events; meetings; conferences, etc. of the past week
  - Upcoming calendar events; meetings; conferences, etc.
  - Important project milestones
  - New or unresolved policy issues
  - Program implementation/execution issues
  - New and outstanding Change Control Requests
  - Review of CERP Information Technology Initiation Forms (CITIFs) and assignments
2. This teleconference should be used to highlight issues, to make everyone aware of the issue and to outline how resolutions will be sought. Issues are not intended to be resolved during these discussions. However, outstanding issues should be documented by the facilitator and assigned to individuals or departments for resolution.
3. The SFWMD IT Project Manager, will co-chair the weekly teleconference with the USACE IT Project Manager. Teleconference will typically be no more than 60 minutes. Rescheduling of the weekly teleconference should be coordinated through the two co-chairs.
4. Change Control requests should be submitted by COB the preceding Friday to permit adequate review. The requestor should be present for discussion and to answer questions.
5. The meeting facilitator will prepare meeting minutes summarizing the issues, discussions and decisions made during the teleconference. This document will become official record and will be accessible through the CERPZone intranet site ([www.cerpzone.org](http://www.cerpzone.org)) for review.
6. This conference call is not a substitute for good standard staff actions and should complement CIO meetings and subject specific meetings.

# CERP INFORMATION MANAGEMENT/ INFORMATION TECHNOLOGY (IM/IT) PROGRAM

## IM/IT PROGRAM GUIDANCE

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<b>GOVERNANCE STRUCTURE .....</b>	<b>1</b>
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**APPENDIX A: TMB CHARTER**

**APPENDIX B: ESC CHARTER**



## IM/IT Program Governance

The IM/IT governance structure, including information from this Guidance document, is implemented to ensure that the appropriate level of attention is given to this critical aspect of CERP. Organizationally, the Corps of Engineers Jacksonville District and the South Florida Water Management District must coordinate IM/IT similar to many other aspects of the CERP partnership. CERP executives are also responsible for the effective implementation of legislative and executive mandates associated with IM/IT and determination of the appropriate level of technology investments in all CERP-wide program elements and individual projects. This executive-level responsibility is imposed by legislation, regulations, executive orders, organizational directives, and CERP management needs.

CERP began the process of redefining and reorganizing the IM/IT program structure in 2002 with the *CERP IM Plan* effort. The original plan, which is now a living document, serves as a guide for developing the ideal CERP IM/IT program. It includes an implementation, roadmap, and timeline that are the comprehensive framework for identifying, coordinating, prioritizing, and performing IM efforts needed to solidify the CERPZone concept and make it a reality.

The first two tasks outlined in the *CERP IM Plan* were the formation of an internal governance and review board as well as an Executive Steering Committee. The Executive Steering Committee (ESC) charter is appended to this document and has already been completed, thereby establishing the IM/IT program ESC. One of the purposes of this document is to provide the charter for the Technology Management Board (TMB). The TMB Charter (*Appendix A*) will serve as the internal governance and review board that was discussed in the *CERP IM Plan*.

### Program Guidance Structure

The rest of this document is divided into three main sections. The *Governance Structure* section provides a recap of the ESC structure, presents the TMB structure, and describes the User Engagement concept. The *IM/IT Program Toolset* section describes the additional resources available to the ESC and TMB for guidance on maintaining a successful IM/IT program, including the *CERP IM Plan*, the User Engagement strategy, and additional communication and management tools. Finally, the *IM/IT Program Policies* section provides a consolidated list of important policies that should be followed as the TMB and ESC act on their responsibilities. These policies are defined in this document and in the charters at a conceptual level, but the actual policies themselves (e.g., well-defined processes and operating procedures) will be defined over time. As this document becomes electronic in the future, the policies and toolsets will be presented as links to the actual references.

This document also includes two attachments. *Appendix A* is the full TMB Charter. *Appendix B* is the full ESC Charter.

The program guidance is presented along with the TMB and ESC Charters in this document to help the ESC and TMB know what resources are available and what IM/IT policies should be followed.

## Governance Structure

The IM/IT governance structure consists of the ESC, TMB, and User Engagements. This section recaps the ESC structure, provides the TMB structure, and describes the User Engagement concept.

### Executive Steering Committee

This section recaps key components of the ESC Charter to provide a basis of comparison for the TMB Charter. More details about the ESC are available in the ESC Charter itself, which is presented in *Appendix B*.

The ESC is co-chaired by the Restoration Program Managers of the partner organizations. Beyond the co-chairs, the membership includes the CIOs of the partner organizations and the Managers of the Restoration Program Management Office with CERP-wide budget and expenditure responsibility.

At least during the initial phase of the IM/IT governance structure, the ESC authorizes the establishment of the TMB to ensure that daily operations are running smoothly and efficiently. The ESC retains the authority to perform

periodic reviews of the effectiveness of the IM/IT program and the TMB, identify opportunities for enhancing the program, and implement enhancements based on approval from the CERP executive program managers.

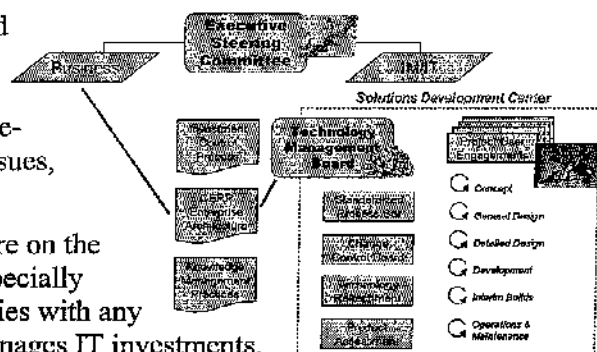
More detailed information on the ESC's interaction with the TMB is provided in the TMB Charter (*Appendix A*).

## Technology Management Board

This section presents a brief look at the structure and responsibilities from the TMB Charter. The actual TMB Charter (*Appendix A*) outlines the TMB's objectives, describes the organization, and presents guiding operational principles. From a practical standpoint, the TMB can help the IM/IT program by performing similar activities to the ESC on a project-specific basis, thereby ensuring that investments meet business needs; leverage efforts both internal and external to the partner organizations; and are cost-effective, secure, and appropriate for the intended information/technology users. Additionally, the TMB will be responsible for the day-to-day management of *CERP IM Plan* concepts, ensuring that the comprehensive plan is being followed throughout the organization.

The TMB will work closely with the ESC to manage the processes and policies that guide CERP's IM/IT program. The ESC's responsibilities are similar in many ways to those of the TMB, but the ESC exists to manage information and investments on an enterprise-wide level. The TMB will need some knowledge of enterprise-level issues, but will work more with individual project sponsors than the ESC.

The relationship between the ESC and the TMB is pictured in the figure on the right. The ESC watches over the IM/IT aspects of the CERP and is especially careful of balancing the program's business needs and outlined strategies with any proposed and existing IT investments. On a project level, the TMB manages IT investments, ensures compliance with the CERP Enterprise Architecture (EA), and guarantees that the CERP IM/IT program is helping to manage CERP knowledge. The TMB will also have the ability to escalate project-related issues to the ESC for review (e.g., an IT investment hits a monetary threshold at which the ESC must review its progress and worth).



In addition to work with the ESC, the TMB will also work as a part of the Solutions Development Center on individual User Engagements. The Solutions Development Center (another concept from the *CERP IM Plan*) includes the creation of policies, procedures, meta-organizations, and control structures based on a government-approved capability maturity model (CMM) to promote quality assurance/control, coordination, and accountability into the development and deployment process. The policies and processes established by the Solutions Development Center (SDC) will serve as the basis for the TMB/SDC interaction. The TMB will work on individual User Engagements (again, on a project-by-project basis) to ensure that projects are following established SDC policies.

*Appendix A* serves as the Charter for the TMB, and details the full responsibilities of the organization regarding interaction with the ESC and engagements with users.

## User Engagement and Customer Relationships

The TMB will engage with individual project sponsors on Project User Engagements based on the need for an engagement. An engagement can be considered as an individual effort or project investment that the TMB will be reviewing and helping through the set of SDC processes. The structured SDC will comprise the sponsors, policies, and tools that make up a successful IM/IT program. In other words, the TMB will use reusable SDC policies and tools on project-by-project User Engagements but will tailor the policy based on the nature of the User Engagement and help the sponsor of the project or effort to meet the necessary policies or deal with the ESC.

The objective of the SDC is to institutionalize policies, procedures, meta-organizations, and control structures based on a government-approved capability maturity model (CMM) to promote quality assurance/control, coordination, and accountability into the development and deployment process. By utilizing successful and reusable processes and tools across an IM/IT program, CERP will greatly improve the efficiency of their current environment of IM/IT processes. Additionally, by using established communication strategies and avenues in the SDC environment, there will be no confusion throughout the organization as far as what processes must be followed, who holds Project User

Engagement responsibilities, and what the escalation avenues are. Simply put, the SDC and Project User Engagements will encourage process unanimity throughout CERP.

Each User Engagement Group will consist of a sponsor, technical staff (e.g., Web developer), and program staff (e.g., system users). Some individuals in the group may perform multiple roles, but an accountable sponsor who works with the TMB must be designated. Full information on the Project User Engagement and Customer Relationships will be described as a part of future **B&M1 deliverables (Establish a Structured Solutions Development Center)**, as found in the *CERP IM Plan*. Additionally, communication strategies for the TMB/SDC relationship will be described as a part of future **C&E3 deliverables (Define and Implement Ongoing IM/IT Communication Strategy)**, as found in the *CERP IM Plan*.

#### AREAS OF JOINT RESPONSIBILITY

In an individual Project User Engagement, the project sponsors and the TMB will work together to:

- Follow established SDC policies and guidance on meeting project objectives and milestones
- Meet requirements on documenting assets (e.g., design document, completed investment forms) and maintaining asset inventories for investment review purposes
- Meet requirements for managing semantics and data standards for communication within CERP
- Follow the established systems lifecycle process with interim checkpoints
- Prepare investment review materials and participate in required reviews
- Request changes through the formal change control process
- Understand and adhere to established enterprise architecture guidelines

### IM/IT Program Toolset

This section presents the additional resources available to the ESC and TMB for guidance on maintaining the IM/IT Program successfully. These resources currently include the *CERP IM Plan*, *User/Customer Engagement Strategies*, and *Additional Communication and Management Tools*. Each resource is described briefly, but the resource itself exists elsewhere.

Additional tools may be added to this section over time.

#### **CERP IM Plan**

CERP began the process of redefining and reorganizing the IM/IT program structure in 2002 with the *CERP IM Plan* effort. The *CERP IM Plan* serves as a guide for developing the ideal CERP IM/IT program. It includes an implementation, roadmap, and timeline that are the comprehensive framework for identifying, coordinating, prioritizing, and performing IM efforts needed to solidify the CERPZone concept and make it a reality.

The first two tasks outlined in the implementation plan were the formation of an internal governance and review board as well as an Executive Steering Committee. The Executive Steering Committee (ESC) Charter is included in this document as *Appendix B*, thereby establishing the IM/IT program ESC. *Appendix A* outlines the charter for the TMB. Anticipated future efforts described in the *CERP IM Plan* include the development of the technical and systems architecture, a toolset to manage the IM/IT program, a defined capital planning and investment control process, an ongoing IM/IT communication strategy, and the established SDC.

#### **User/Customer Engagement Strategy**

The concept of User Engagement strategies is defined above in the *User Engagement and Customer Relationships* section. Full information on the Project User Engagement and Customer Relationships will be described as a part of future **B&M1 deliverables (Establish a Structured Solutions Development Center)**, as found in the *CERP IM Plan*. Some examples of current User/Customer Engagements include:

- Implementation of Data Management PMP
- Roll-out of Collaboration Software
- Establishment of Inter-Agency Modeling Center

The strategy provides clear channels for these engagements to be managed under the TMB and ESC structures.

## ***Additional Communication and Management Tools***

Additional communication and management tools will be useful to TMB and ESC members in the future. Namely, those deliverables developed as a part of the **MoP2 (Develop and Maintain Toolset to Manage the IM/IT Program)** and **C&E3 (Define and Maintain Ongoing IM/IT Communication Strategy)**, as found in the *CERP IM Plan*. Some possibilities of deliverables and tools include context diagrams, success diagrams, communication processes and strategies, stakeholder lists, and IT project summaries. These deliverables will provide additional help to the TMB and ESC in managing the IM/IT program in the future as well as communicating the strategies and processes throughout the SDC.

## ***IM/IT Program Policies***

This section provides a consolidated list of important policies that should be followed as the TMB and ESC act on their responsibilities. These policies are defined here and in the Charters at a conceptual level, but the actual policies themselves (e.g., well-defined processes and operating procedures) will be defined over time. As each of these policies is developed, they will be referenced in their respective section below.

Other policy concepts may be added here over time if a need arises.

## ***Investment Authorization/Escalation Process***

The investment authorization/escalation policies will be the processes through which the TMB and the ESC will authorize or disallow proposed investments and decide which organization is accountable for delivery. These investment authorization processes will include the concept of investment authorization and review; scenarios for investment review interaction between the TMB, ESC, and users; scenarios for disinvestments in an existing effort; and the types of criteria that will escalate an investment through the process chain. Actual process details will be provided as a part of **P&C4 (Define and Implement Capital Planning and Investment Control Process)**, as found in the *CERP IM Plan*.

## ***Investment Inventory and Portfolio Maintenance***

The Investment Inventory and Portfolio Maintenance policies will be the processes for maintaining a diverse and robust investment portfolio throughout CERP. Additionally, these policies will outline the importance of and methods for updating and maintaining Enterprise Architecture materials. The process for implementing consolidated system asset and IT investment inventories will be included as well. Actual process details for maintaining a portfolio will be provided as a part of **B&M1 deliverables (Establish a Structured Solutions Development Center)**, as found in the *CERP IM Plan*. For CERP to have a comprehensive understanding of their portfolio, they must maintain the inventories, and these can be found in the asset inventory maintenance policies established in the **MoP3 deliverables (Develop and Maintain Technical and Systems Architectures)**, as found in the *CERP IM Plan*.

## ***In-process Reviews and Adjustments***

The In-process Reviews and Adjustments policies are the processes for maintaining the Control Phase portion of an investment review lifecycle. Both the ESC and TMB will conduct investment reviews to gauge intermediate progress during system development, hardware purchase, and the like. These processes and associated adjustment guidance will be provided as a part of the **P&C4 deliverables (Define and Implement Capital Planning and Investment Control Process)**, as found in the *CERP IM Plan*.

## ***Change Request and Control***

The Change Request and Control policies are necessary if projects switch direction or need additional significant investments. There are currently existing CERP processes for change control. This section will link to change control process information that is already in place in CERP. Though the policies are in place, it is possible that the change control process will change some based on direction from the CERP IM Plan (e.g., routing of individuals responsible for signing will change, variance processes change).

## ***Process Asset Library Creation and Maintenance***

The Process Asset Library Creation and Maintenance policies are necessary for creating and maintaining the organized documentation of IM/IT processes that are already established and will be established in the future. Additionally, these policies provide details about the communication strategies that are necessary to manage this knowledge throughout the organization. These policies will be provided as a part of **B&M1 deliverables (Establish a Structured Solutions Development Center)**, as found in the *CERP IM Plan*. The policies will provide guidance on ensuring that documentation is organized, consistent, and repeatable, and will provide the templates that will support CERP IM/IT program decisions in the future. The basic concept of these policies is that processes should be well communicated, easily referenced, and repeatable throughout the IM/IT Program. These process assets will significantly decrease the burden on the TMB by requiring each User Engagement to produce similar documents for the TMB's review and signoff.

## ***Program Review and Continual Improvement Process***

The Program Review and Continual Improvement Process policies describe the ideal process possibilities for evaluating the overall success of the CERP IM/IT program against its goals. The actual information on how CERP will evaluate program progress will be provided as a part of the **MoP2 (Develop and Maintain Toolset to Manage the IM/IT Program)** deliverables, as found in the *CERP IM Plan*.

## ***Technology Awareness and Refreshment Responsibilities***

The Technology Awareness and Refreshment Responsibilities policies detail the processes that should be followed to maintain an awareness of existing and emerging technologies. By maintaining a knowledge of available technologies, CERP IM/IT officials can determine when changes to the existing technical architecture are necessary or identify opportunities for expanding the technical landscape within the CERPZone. Information on how to maintain technological awareness will be presented in the **MoP3 deliverables (Develop and Maintain Technical and Systems Architectures)**, as found in the *CERP IM Plan*.

**APPENDIX A**  
**TMB CHARTER**

# CHARTER FOR THE COMPREHENSIVE EVERGLADES RESTORATION PROGRAM (CERP) IM/IT TECHNOLOGY MANAGEMENT BOARD

## VISION

*The CERP Information Management & Information Technology (IM/IT) program is critical to the successful delivery of long-term restoration outcomes. The program imposes consistent and technology-enabled implementation of business processes (modeling, project management, water quality monitoring, etc.) and improves data collection, analysis, and re-usability/quality. As a result: 1) managers have the information required to understand the condition of, and threats to, the Everglades 2) the partner organizations have the necessary processes, information, and technology to achieve CERP's long-term and short-term objectives, and 3) all stakeholders have reliable and well-documented data.*

## BACKGROUND

The IM/IT governance structure is implemented to ensure that the appropriate level of attention is given to this critical aspect of CERP. Organizationally, the Corps of Engineers Jacksonville District and the South Florida Water Management District must coordinate IM/IT similar to many other aspects of the CERP partnership. CERP executives are also responsible for the effective implementation of legislative and executive mandates associated with IM/IT and determination of the appropriate level of technology investments in all CERP-wide program elements and individual projects.

The Technology Management Board (TMB) Charter outlines the TMB's objectives, describes the organization, and presents guiding operational principles. From a practical standpoint, the TMB can help the IM/IT program by performing similar activities to the Executive Steering Committee (ESC) on a project-specific basis, thereby ensuring that investments meet business needs; leverage efforts both internal and external to the partner organizations; and are cost-effective, secure, and appropriate for the intended information/technology users. Additionally, the TMB will be responsible for the day-to-day management of CERP IM Plan concepts, ensuring that the comprehensive plan is being followed throughout the organization.

## OBJECTIVES

The objectives of CERP's TMB are described below.

- *Project-scale IT Management* – Perform the day-to-day management of the IM/IT program across CERP, on a project-scale basis as opposed to enterprise-wide. Specific actions include, but are not limited to, defining IM/IT policies and toolsets for ESC approval (e.g., investment authorization process), ensuring that adequate IT resources are available and committed to all authorized IT projects, and ensuring compliance and consistency with mandates. In general, the TMB should be considered a management board for typical IT projects, whereas the ESC is a management board for major IT projects. The criteria for these types of projects will be defined by the TMB as a part of their policy-definition responsibilities.
- *CERP IM Plan Implementation* – Ensure that all components of the CERP IM/IT program are managed and protected as shared corporate assets. Specific actions include, but are not limited to, the implementation of initiatives from the CERP IM Plan, managing the Enterprise Architecture, and the oversight of projects to guarantee that they are compliant with the CERP IM Plan vision and aligned with the CERP Zone direction and Data Management Program Management Plan. This objective is similar to that presented in the ESC Charter, but the TMB is charged with communicating the CERP IM Plan vision on a project-by-project basis.
- *Investment Portfolio Maintenance* – Evaluate, prioritize, and authorize investments associated with IM/IT and hold the IM/IT program and its customers accountable for achieving benefits that were anticipated for authorized investments. Investment sponsors will follow standard procedures for proposing investments, and it will be the TMB's job to ensure that the full range of CERP's investments are varied in nature, but at the same time are compliant with regulatory mandates and the CERP Enterprise Architecture. Specific actions include, but are not limited to, conducting an inventory of all existing investments, approving or disapproving investments based on defined criteria, managing investment retirement, and conducting in-process reviews to ensure that investments are achieving their intended results.
- *Project Level and ESC Mediation* – Act as a liaison between the project-level sponsors and users and the ESC by reporting progress of projects to the ESC and escalating major investment and project decisions to the ESC when necessary. The ESC will only be interested in major efforts and investments, but the TMB should report to the ESC on a regular basis on any issues that have arisen as a part of investment portfolio maintenance or overall project-scale IT management. Escalation criteria will be defined as a part of the investment authorization process, and the TMB will follow those processes to determine when project-level representatives should meet with the ESC and communicate what is required to the project-level representative.

- *User Engagement and Solutions Development Center Management* – Define and manage the operating principles behind the TMB's engagement with specific project/investment users as well as the Solutions Development Center (SDC). Specific actions include, but are not limited to, establishing standardized SDC processes (e.g., system lifecycle process), communicating process information to project users and sponsors (e.g., assisting a project sponsor in preparing investment review materials for the TMB or ESC), and defining common communication strategies.

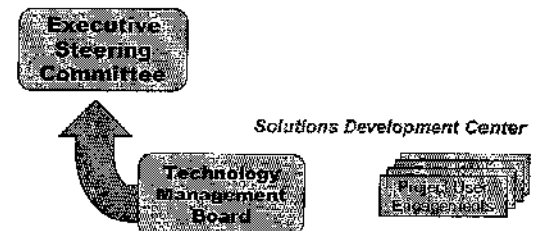
Additional detailed roles, projects, products, and timelines are maintained in the *CERP IM Plan*. The investment review policies, change control policies, Enterprise Architecture guidance, knowledge management practices, and User Engagement responsibilities are described throughout this document, but will be defined as a part of implementing the *CERP IM Plan*.

## ORGANIZATION

The TMB is the accountable operations and project management body for IM/IT investments and projects that support CERP. The body is co-chaired by the CERP IM/IT Program Managers of the partner organizations. Beyond the co-chairs, the membership rotates based on the current User Engagement or interaction with the ESC. At a minimum, one representative from each Project User Engagement Group will work with the TMB at key decision points (e.g., initial kickoff, concept validation, design review) as well as on an as-needed basis (e.g., advice, re-use/buy/build options).

The TMB works with the BSC to ensure that project-specific issues are addressed and the overall mission for the CERP IM/IT program is understood. The TMB will escalate any projects or investments for review by the ESC based on a set of criteria that the TMB will define soon. In general, the TMB will manage projects and the ESC will manage the CERP IM/IT program. Additionally, the TMB will work with users in a structured SDC framework to follow established CERP IM/IT program policies. All participants in the CERP program are responsible for identifying potential IM/IT investments and projects that are outside the scope of authorized processes and, when required, alerting the TMB and the ESC about potential unauthorized investments or efforts.

The TMB retains the authority to perform periodic reviews of the effectiveness of CERP IM/IT policies, identify areas where the Project User Engagements and the SDC can improve, and implement enhancements based on approval from the CERP executive program managers.



## OPERATING PRINCIPLES

To achieve the objectives and realize the CERP To-Be Architecture, the TMB is committed to providing the project oversight required for the IM/IT program, the ESC, and the CERP program/project teams to operate with the following guiding principles in mind. These principles are similar to the principles that guide the ESC, but are tailored to the specifics of the TMB.

- *Encourage a successful IT provider/customer relationship:*
  - Ensure that the partner organizations share resources to serve the needs of CERP users.
  - Cooperate with the ESC and the IM/IT program stakeholders to maintain alignment with the operational architecture and the *CERP IM Plan*.
  - Work with the project managers to determine the viability of and necessity for IT investments.
  - Work with the project managers to correct any issues surrounding an IT investment.
  - Act as a steward for project managers in meeting standard IT procedures.
- *Work across organizational boundaries:*
  - Recognize that the partner organizations need to utilize their existing solutions but also have joint technology needs.
  - Gather members of the partner organizations to ensure that the needs of the program and partner organization are met when evaluating investments.
  - Plan the concepts for the SDC and User Engagement strategies across the partner organizations.
- *Create and maintain innovative product and information solutions:*
  - Emphasize the need for uniformity and organization in data sets and access tools.
  - Provide the operational-level momentum for maintaining a flexible CERPZone.
  - Encourage the existence of quality, documented data.
  - Successfully organize and present information so that it can be effectively used to draw important conclusions (e.g., knowledge management).
  - Encourage technology awareness and refreshment.
- *Support the successful implementation of CERP:*
  - Coordinate the CERP IM/IT efforts so that programmatic and project approaches are emphasized.



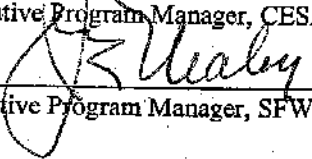
- Allow organizations to share responsibilities for success while maintaining a measure of independence.
- Review investments to ensure compliance with the operational and technical architecture.

#### AUTHORITY

This charter is effective immediately upon the CERP program management signature. Any provisions in previous charters or other directives that may be inconsistent with this charter are hereby superseded.

  
Executive Program Manager, CESA

4/8/03  
Date

  
Executive Program Manager, SFWMD

4/8/03  
Date

**APPENDIX B**  
**ESC CHARTER**

# CHARTER FOR THE COMPREHENSIVE EVERGLADES RESTORATION PROGRAM (CERP) IM/IT EXECUTIVE STEERING COMMITTEE

## VISION

*The CERP Information Management & Information Technology (IM/IT) program is critical to the successful delivery of long-term restoration outcomes. The program imposes consistent and technology-enabled implementation of business processes (modeling, project management, water quality monitoring, etc.) and improves data collection, analysis, and re-usability/quality. As a result: 1) managers have the information required to understand the condition of, and threats to, the Everglades 2) the partner organizations have the necessary processes, information, and technology to achieve CERP's long-term and short-term objectives, and 3) all stakeholders have reliable and well-documented data.*

## BACKGROUND

The IM/IT governance structure is implemented to ensure that the appropriate level of attention is given to this critical aspect of CERP. Organizationally, the Corps of Engineers Jacksonville District and the South Florida Water Management District must coordinate IM/IT similar to many other aspects of the CERP partnership. CERP executives are also responsible for the effective implementation of legislative and executive mandates associated with IM/IT and determination of the appropriate level of technology investments in all CERP-wide program elements and individual projects. This executive-level responsibility is imposed by legislation, regulations, executive orders, organizational directives, and CERP management needs. From a practical standpoint, the Executive Steering Committee can help the IM/IT program ensure that investments meet business needs; leverage efforts both internal and external to the partner organizations; and are cost effective, secure, and appropriate for the intended information/technology users.

## OBJECTIVES

The objectives of CERP's Executive Steering Committee (ESC) are described below.

- *Enterprise wide IT Management* – Manage IT across CERP by coordinating among Program elements, developing and/or endorsing appropriate IM/IT policy guidance, conducting CERP IM Plan oversight, identifying opportunities for leveraging investments across program elements, and ensuring compliance and consistency with mandates when it is needed. Implementing policies on a project-by-project basis and managing particular components of the IM/IT program remain the responsibility of Technology Management Board and the Solutions Development Center.
- *CERP IM Plan Implementation* – Ensure all components of the CERP IM/IT program are managed and protected as shared corporate assets. Specific actions include, but are not limited to, the oversight of major information-related projects and implementation and maintenance of the CERP IM Plan. (Note: The Technology Management Board performs the day-to-day activities associated with this objective).
- *Investment Review & Oversight* – Evaluate, prioritize and authorize major investments associated with IM/IT and hold the IM/IT program and its customers accountable for achieving benefits that were anticipated for authorized investments. Specific actions include, but are not limited to, defining and implementing an investment/disinvestment review process, authorizing major investments, and conducting in-process reviews to ensure that investments are achieving their intended results.
- *Strategic & Tactical Planning* – Align and prioritize CERP information management efforts with programmatic requirements and participate in cross-organizational IT planning efforts to provide clear direction to the IM/IT program. Specific actions include, but are not limited to, assessing major business priorities, enforcing and/or requesting updates to the CERP Operational Architecture, and monitoring compliance with existing mandates.
- *IM/IT Program Support & Sponsor* – Support delivery of existing and new tools that are critical to CERP and provide an executive-level voice for the IM/IT program. Specific actions include, but are not limited to, ensuring adequate participation by the IM/IT program customers (e.g., project managers, program element representatives), communicating successes and challenges to other senior and executive CERP leaders, and evaluating the continuing progress of the IM/IT program.

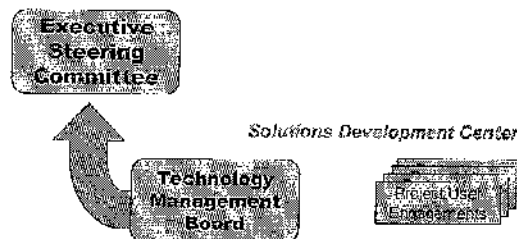
Additional detailed roles, projects, products, and timelines are maintained in the CERP IM Plan, a living management tool for tracking, prioritizing, and completing specific tasks and implementing the IM/IT program. The actual investment review, enterprise architecture guidance, knowledge management practices, and TMB responsibilities are defined in the TMB Charter and will be established in future phases of the CERP IM Plan.

## ORGANIZATION

The ESC is the accountable steering and governing body for IM/IT investments in support of CERP. This body is co-chaired by the Restoration Program Managers of the partner organizations. Beyond the co-chairs, the membership includes the CIOs of the partner organizations and the Managers of the Restoration Program Management Office with CERP-wide budget and expenditure responsibility.

At least during the initial phase of the IM/IT governance structure, the ESC authorizes the establishment of a Technology Management Board (TMB) that ensures daily operations are running smoothly and efficiently. The TMB is responsible for defining the components of the new IM/IT program for ESC approval, conducting an inventory of all existing investments, escalating major investment decisions to the ESC, establishing the Solutions Development Center, and performing other related tasks as outlined in the approved CERP IM Plan. Consistent with ESC direction, the TMB is also responsible for ensuring adequate IT resources are available and committed to all authorized IT projects and user engagements. All participants in the CERP program are responsible for identifying potential IM/IT investments that are being made outside of the authorized process and, when required, alerting the TMB and/or ESC about the potential unauthorized investment.

The ESC retains the authority to perform periodic reviews of the effectiveness of the IM/IT program and the TMB, identify opportunities for enhancing the program, and implement enhancements based on approval from the CERP executive program managers.



## OPERATING PRINCIPLES

To achieve the objectives and realize the CERP To-Be Architecture, the ESC is committed to providing the executive oversight required for the IM/IT program and the CERP program/project teams to operate with the following guiding principles in mind:

- *Encourage a successful IT provider/customer relationship:*
  - Ensure that the partner organizations share resources to serve the needs of CERP users.
  - Cooperate with the TMB and IM/IT program stakeholders to maintain alignment with the operational architecture and the CERP Plan.
  - Work with applicable project managers to determine the viability of and necessity for major IT investments.
  - Work with applicable project managers to correct any issues surrounding a major investment.
- *Work across organizational boundaries:*
  - Emphasize the need to work across partner organizations and with other stakeholders.
  - Recognize that the partner organizations need to utilize their existing solutions but also have joint technology needs.
  - Gather members of the partner organizations to ensure that the needs of the program and partner organizations are met when evaluating investments.
- *Create and maintain innovative product and information solutions:*
  - Emphasize the need for uniformity and organization in data sets and access tools.
  - Provide the momentum for maintaining a flexible CERPZone.
  - Encourage the existence of quality, documented data.
  - Strive for a single point of user access for a broader user community.
  - Successfully organize and present information so that it can be effectively used to draw important conclusions (e.g., knowledge management).
- *Support the successful implementation of CERP:*
  - Coordinate CERP IM/IT efforts so that programmatic and project approaches are emphasized.
  - Allow organizations to share responsibilities for success while maintaining a measure of independence.
  - Review major investments to ensure compliance with the operational and technical architecture.

## AUTHORITY

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\_\_\_\_\_  
Executive Program Manager, CESAJ      Date

\_\_\_\_\_  
Executive Program Manager, SFWMD      Date

\_\_\_\_\_  
Chief Information Officer, CESAJ      Date

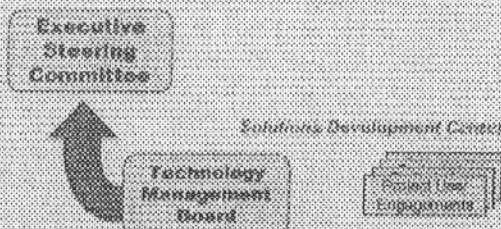
\_\_\_\_\_  
Chief Information Officer, SFWMD      Date

\_\_\_\_\_  
Program Office Manager, CESAJ      Date

\_\_\_\_\_  
Program Office Manager, SFWMD      Date

At least during the initial phase of the IM/IT governance structure, the ESC authorizes the establishment of a Technology Management Board (TMB) that ensures daily operations are running smoothly and efficiently. The TMB is responsible for defining the components of the new IM/IT program for ESC approval, conducting an inventory of all existing investments, escalating major investment decisions to the ESC, establishing the Solutions Development Center, and performing other related tasks as outlined in the approved CERP IM Plan. Consistent with ESC direction, the TMB is also responsible for ensuring adequate IT resources are available and committed to all authorized IT projects and user engagements. All participants in the CERP program are responsible for identifying potential IM/IT investments that are being made outside of the authorized process and, when required, alerting the TMB and/or ESC about the potential unauthorized investment.

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 4/8/03 Date

 4/8/03 Date

Program Office Manager, CESAJ Date

 4/8/03 Date

 4/8/03 Date

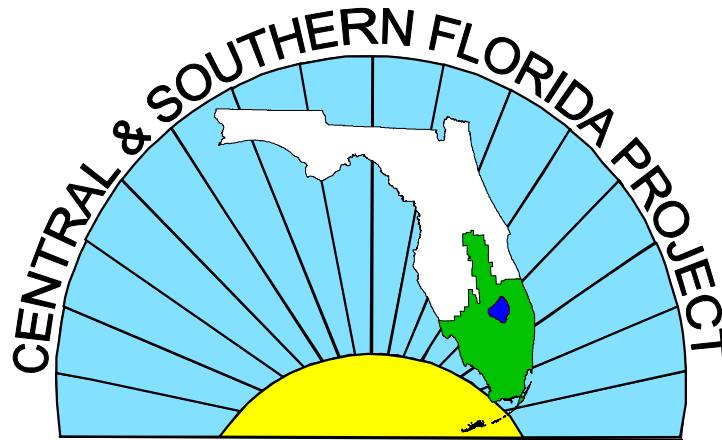
Program Office Manager, SFWMD Date

21 December 2004

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**CENTRAL AND SOUTHERN FLORIDA PROJECT**

**COMPREHENSIVE EVERGLADES  
RESTORATION PLAN**



**COMPREHENSIVE EVERGLADES  
RESTORATION PLAN**

**PROJECT MANAGEMENT PLAN**

**Regional Engineering Model  
for Ecosystem Restoration**



**U.S. Army Corps of Engineers  
Jacksonville District**

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**Regional Engineering Model for Ecosystem Restoration  
FOR THE PROJECT DELIVERY TEAM:**

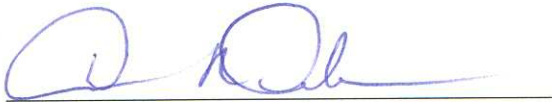


JAMES VEARIL

Project Manager

U.S. Army Corps of Engineers, Jacksonville District

**FOR THE DESIGN COORDINATION TEAM:**



DENNIS R. DUKE, P.E.

Chief, Restoration Program Division

U.S. Army Corps of Engineers, Jacksonville District

1/10/05  
Date:

**FOR THE PROJECT REVIEW BOARD, USACE:**



RICHARD E. BONNER, P.E.

Deputy District Engineer for  
Project Management

1/10/05  
Date:

## ***REMER Program Management Plan (PMP)***

### **REMER**


#### **USACE PDT Team Commitment**

We, the USACE Project Deliver Team (PDT) Representatives for REMER have been empowered by our district leadership to deliver a quality project quickly and efficiently. As such, we have developed an initial Project Management Plan (PMP) to complete the work associated with delivery of the REMER products noted in the PMP.

We recognize that change will occur during the life of this project. We also, understand that the PMP is a "living document" capable of being changed to reflect changes in scope, schedule and budget requirements.

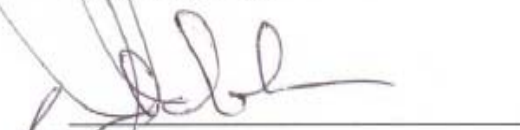
We, the USACE PDT Representatives, do hereby commit our staffs to completing quality products within the bounds of the defined scope, schedule and budget for REMER


  
Sean Smith, EN-H

  
Tom Leicht, EN-D

  
Earl Edris, CEERD-HF-H

  
Luis Ruiz, EN-G

  
Donna Casey, IM-I

  
Stu Applebaum, DP-R



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**1.2 List of Acronyms**

APT	Aquifer Performance Test
BBCW	Biscayne Bay Coastal Wetlands
C-111 SC	C-111 Spreader Canal
C&SF	Central and South Florida
CERP	Comprehensive Everglades Restoration Plan
CESAJ	U.S. Army Corps of Engineers, Jacksonville District
CRA	Continuing Resolution Authority
EAA	Everglades Agricultural Area
ENP	Everglades National Park
EPJV	Everglades Partners Joint Venture
ERDC	Engineer Research and Development Center
ET	Evapotranspiration
FWS	U.S. Fish and Wildlife Service
FY	Fiscal Year
GIS	Geographic Information System
GUI	Graphical User Interface
H&H	Hydrology and Hydraulics
HSE	Hydraulic Simulation Engine
IMC	Interagency Modeling Center
ISGW	Integrated Surface Water Groundwater Model
IT	Information Technology
ITR	Independent Technical Review
LO	Lake Okeechobee
MEG	Model Evaluation Group
MSE	Management Simulation Engine
NAD83	North American (Horizontal) Datum 1983
NAVD88	North American Vertical Datum 1988
NGVD29	National Geodetic Vertical Datum 1929
NSM	Natural System Model
ORI	Operational Rules Inventory (Task Order Contract)
P	Phosphorous
PDT	Project Delivery Team
PMP	Project Management Plan

PRB	Project Review Board
QA/QC	Quality Assurance/Quality Control
RC	Rating Curves
RECOVER	Restoration, Coordination, and Verification
REMER	Regional Engineering Model for Ecosystem Restoration
RMDSC	REMER Model Development Steering Committee
RMRIT	Regional Requirements Investigation Team
RSM	Regional Simulation Model
SFWMD	South Florida Water Management District
SFWMM	South Florida Water Management Model
SFNSM	South Florida Natural System Model
SFRSM	South Florida Regional Simulation Model
TOC	Task Order Contract
TMDL	Total Maximum Daily Load
TM	Technical Memorandum
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WASH123D	WATERSHed Systems of 1-D stream-river networks, 2-D overland flow regimes, and 3-D subsurface media
WBS	Work Breakdown Structure
WCA	Water Conservation Area
WQ	Water Quality
WRDA	Water Resources Development Act
XML	Extensible Markup Language

### 1.3 List of Project Management Plan Preparers

Members of the Project Delivery Team (PDT):

The following individuals from the U.S. Army Corps of Engineers (USACE), Jacksonville District (CESAJ), the Engineer Research and Development Center (ERDC) and the Interagency Modeling Center (IMC) comprise the core Working Group in the development of this Project Management Plan (PMP). Present anticipated members of the Project Delivery Team (PDT) are provided in Appendix A:

**Table 1-1: PROJECT MANAGEMENT PLAN PREPARERS**

<b>Name</b>	<b>Agency</b>	<b>Job Title</b>	<b>Phone Number</b>
Mitch Granat	CESAJ-EN-HI	Hydraulic Engineer	904-232-1849
Russ Weeks, P.E.	CESAJ-EN-HI	Hydraulic Engineer	904-232-1159
Maged Hussein, Ph.D., P.E.	CESAJ-EN-HI	Hydraulic Engineer	561-682-2210
Earl Edris, P.E.	CEERD-HF-H	Supervisory Hydraulic Engineer	601-634-3378
Chuck Tate	CEERD-HF-HE	Research Hydraulic Engineer	601-634-2120
Frank Metzler	Everglades Partners Joint Venture (EPJV)	Consultant – Senior Project Manager	904-232-1009
Chris Brown, P.E.	CESAJ-EN-G	Senior Engineer	904-232-1008
Michael Fies, P.G.	CESAJ-EN-G	Senior Hydrogeologist	904-232-1267

## **2.0 PROJECT INFORMATION**

### **2.1 Background**

This document comprises the initial PMP describing the development and application of the new Regional Engineering Model for Ecosystem Restoration (REMER). The regional engineering model for environmental restoration is an application of the WaterShed systems of 1-D stream-river networks, 2-D overland regimes, and 3-D subsurface media (WASH123D) version 2.0 modeling code for the Comprehensive Everglades Restoration Plan (CERP) project area. WASH123D is a numerical model for the simulations of variable density water flow and contaminant and sediment transport. This finite element numerical modeling code was developed by Professor George Yeh (Yeh, et al, 2003). Ongoing efforts to plan and design the initially authorized projects under CERP have reconfirmed the critical need for accurate predictive numerical models capable of simulating the complex hydrologic and hydrodynamic processes at work in southern Florida on local, regional and system-wide scales. A need exists for a flexible and powerful engineering modeling tool capable of addressing detailed hydrologic and hydraulic processes using first principles of physics at a range of scales. While the South Florida Water Management District (SFWMD) has historically relied on the South Florida Water Management Model (SFWMM), aka the 2X2 model, it does not provide today's necessary flexibility in regional modeling. SFWMD is now developing the South Florida Regional Simulation Model (SFRSM) to address system-wide hydrology and water management operations issues.

### **2.2 Authority**

Authority for the REMER effort derives from the Water Resources Development Act of 2000 (WRDA) (PL 106-541) enacted in December 2000. The REMER effort was not specifically addressed in WRDA or in the Design Agreement between the Department of The Army and the SFWMD for Design of Elements of the Comprehensive Plan for the Everglades and South Florida Ecosystem Restoration Project (USACE and SFWMD, 2000). However, as with establishment of the IMC, there is an obvious directive to the USACE and SFWMD that tools necessary to accomplish the objective of implementing CERP in a timely fashion be identified and developed whenever they are required. The REMER tool is an example of such a mission-critical need.

### **2.3 Related Projects**

Hydrologic models are at the heart and foundation of all the initially authorized projects. Each active PDT has identified the need for hydrologic models, in addition to many other types of models, in order to simulate existing and future conditions and evaluate the beneficial and potentially harmful impacts of project alternatives. It would not be prudent in this document to discuss each individual model or suite of models being applied to each active CERP project. The following projects provide some indication of the ongoing modeling efforts relevant to the development of the REMER tool.

### 2.3.1 IMC Programmatic Effort

The IMC is discussed in detail in the Programmatic PMP approved in January 2004 (USACE and SFWMD, 2004a). The IMC will be the single point of responsibility for CERP modeling services. It will provide, or coordinate, and oversee the modeling efforts of each PDT and Restoration Coordination and Verification (RECOVER). The IMC will have the primary organizational and production responsibilities for regional and sub-regional CERP modeling and will be the clearinghouse for oversight and coordination of all project-specific CERP modeling. The IMC does not replace existing agency staff and functions. The IMC is a partnership between CESAJ and the SFWMD and is located in West Palm Beach. In addition, the IMC includes, or will include, staff from other CERP participating agencies such as U.S. Fish and Wildlife Service (FWS), U.S. Geological Survey (USGS), and Everglades National Park (ENP).

The IMC will perform the following roles during project development and PMP implementation:

1. The IMC will prepare the requirements for the regional modeling tools to be used for support of CERP.
2. The IMC will provide the direct liaison between the USACE and the SFWMD staff in coordinating data evaluation and analysis, conceptual model development, calibration and validation strategy, and evaluation of interim and final results.
3. The IMC will coordinate the review of selected interim and final work products from the REMER effort that will be conducted by external experts through the establishment of a Model Evaluation Group (MEG).
4. The IMC is intended to be the primary user of REMER and they will maintain and operate the code as needed for CERP implementation purposes.

### 2.3.2 The South Florida Water Management Model (aka 2 x 2 Model)

The SFWMM is a regional-scale computer model that simulates the hydrology and the management of the water resources system from Lake Okeechobee (LO) to Florida Bay. The SFWMM is an integrated surface water-groundwater model based on historical climatic data for the 36-year period of record between 1965 and 2000. This period includes a range of drought and wet periods that encompass a number of extreme hydrologic events for simulation purposes. The SFWMM covers an area of 7,600 square miles using a grid of 2 mile x 2 mile cells. In addition, the model includes inflows from the Kissimmee River and other tributary basins, and simulates several areas (such as the Caloosahatchee River and St. Lucie canal basins) as lumped systems represented by runoff and demand time-series estimates.

The model simulates the major components of the hydrologic cycle in south Florida including rainfall, evapotranspiration (ET), infiltration, overland and groundwater flow, canal flow, canal-groundwater interaction, levee seepage and groundwater pumping. The SFWMM incorporates current and proposed water control structures and current and proposed operational rules. The ability to simulate water shortage policies affecting urban, agricultural, and environmental water uses in south Florida is a major strength of



this model. The model has been calibrated and verified using water level measurements at numerous locations distributed throughout the region within the model boundaries.

The SFWMM is currently the best available tool that can simulate the complexities of the water control system and operational rules of proposed regional-scale water management alternatives and provide adequate information for making water management decisions. Technical staffs from many Federal/state/local agencies and public/private interest groups have accepted the SFWMM as the best available tool for analyzing regional-scale structural and/or operational changes to the complex water management system in south Florida. The large-scale and spatial extent of the model allows it to perform system-wide evaluations. As a result, it has been used as a planning tool, applied to estimate regional-scale hydrologic responses to proposed structural and operational modifications to the water management system in south Florida. The model is used to assess broad scale changes to both the natural and human environment. Results from these regional scale investigations are also used to provide input and boundary conditions for more detailed modeling and investigations at a subregional scale, which in turn provide the bases for detailed design of specific projects.

As a result of the continued increasing multi-purpose demands on water resources, desired sustainability, and improved/restored ecosystem characteristics within south Florida, the need for improved modeling capabilities has also increased. New technology and improved system understanding has also occurred. Development of new, more technically advanced and defensible numerical models is required to keep up with growing demands and requirements placed on a sustainable South Florida.

### **2.3.3 The South Florida Natural System Model (NSM)**

The NSM is an application of the SFWMM with the land surface changed to reflect the actual system without the canals and structures. This model is designed to simulate the hydrologic response of a pre-drained Everglades system. The NSM does not attempt to simulate the pre-drained hydrology. Rather, more recent climatic data is used to estimate the pre-drained hydrologic response to current hydrologic input, as the input data necessary to recreate the hydrologic conditions of the late 1800's or early 1900's do not exist. The use of recent input data, e.g., rainfall, potential ET, tidal and inflow boundaries, allows for comparisons between the current managed system simulated by the SFWMM and the natural system simulated by the NSM under identical climatic conditions.

The NSM is closely linked to the SFWMM discussed above in Section 2.3.2. The NSM uses the same climatic input, model parameters and computational methods as the SFWMM. Physical features, such as topography, vegetation type and river locations are adjusted to represent the pre-drainage condition. Since traditional calibration/verification methods can not be applied to the NSM, model parameters are based on the calibrated and verified SFWMM.

The landscape of present day south Florida has been greatly affected by the land reclamation, flood control and water management activities which have occurred since the early 1900's. The complex network of canals, structures and levees in the current system are replaced in the NSM with the rivers, creeks and transverse glades which were present prior to the construction of drainage canals. The vegetation and topography used by the NSM are based on estimates of pre-drainage conditions. The land cover simulated by the NSM is static, i.e., the model does not attempt to simulate vegetation succession.

As the only comprehensive estimate of pre-drainage hydrology available, the NSM has been used as a guide to general quantities of water and conditions in the pre-drainage system. Due to the uncertainty in the parameters used in the model to represent the pre-drainage hydrology, NSM results should be tempered with empirical evidence drawn from the current natural system. Several reviews have discussed the appropriate uses and estimated accuracy of the model (Fennema and others, 1994, Bales, et al. 1997).

#### **2.3.4 The South Florida Regional Simulation Model (SFRSM)**

The SFRSM is a computer modeling code developed by the SFWMD. It has a Hydraulic Simulation Engine (HSE) capable of simulating the natural hydrology, water control features, water conveyance systems and the storage systems of South Florida.

The SFRSM is the implementation of the RSM modeling code to the region of South Florida. SFRSM will be used to evaluate alternatives being considered under CERP. As the restoration of the Everglades moves from questions related to quantity, timing and distribution of water to questions of water quality, it is imperative that the SFRSM model be built to answer these water-quality questions. At present, SFWMD staff are adding water-quality functionality into RSM by determining what nutrient processes are important in South Florida and incorporating them into SFRSM.

RSM also has a Management Simulation Engine (MSE) capable of simulating management operations in the system. The MSE has two levels of management. At the lower level, adaptive control algorithms or “controllers” carry out slave functions to achieve lower level management. “Assessors” are also being developed to simulate the extremely complicated management system in a more flexible manner. At the higher level, supervisors using linear programming and other methods manage the controllers to achieve certain system-wide objectives. The MSE is described in a separate manual. The local hydrology is simulated using a feature known as “pseudocells”, which allows an abstraction of local hydrology to be captured in a regional model. For an extended discussion on “pseudocells” the reader is referred to a manual prepared by the SFWMD (SFWMD, 2003).

The RSM is a new generation model developed using recent advances in computer technology, computational methods, and Information Technology related developments. It was needed in South Florida as a future replacement for the 2X2 Model to simulate anticipated complex changes to the C&SF system. The complexity of the system is due to the type of conveyance and storage, as well as the operational criteria. The HSE algorithms were developed considering the need to balance the accuracy of a solution

with the efficiency of computations. RSM is developed using the computer language C++ which can use high level abstractions to handle some of the complexity. C++ is an object-oriented language that can use abstractions such as water bodies, water movers, and water distributors in the code. The properties of abstractions, along with the ability to inherit from base types allow opportunities for the code to grow. SFRSM also takes advantage of XML (Extensible Markup Language) architecture to further help streamline and simplify programming requirements. The HSE uses external sparse solvers to obtain the solution efficiently.

### **2.3.5 Brief summary of other Hydrology and Hydraulics (H&H) models being utilized**

In addition to the tools mentioned above, there are numerous other hydrologic models currently being applied to specific CERP projects. Each of these modeling tools presents their own individual strengths and weaknesses and their own unique data input requirements, user interfaces, and outputs. The list of hydrologic models being utilized include Mike-She/Mike-11 and WAMView in the Southwest Florida region at both the subregional and the regional scale; WaSh in Saint Lucie Watershed, MODFLOW, MODNET, and MODBRANCH in numerous parts of the study area; Mike-She/Mike-11 in the Everglades Agriculture Area (EAA); UKiss for the upper Kissimmee River Basin; SICS/TIME and RSM-SEM for the Everglades; TABS for Biscayne Bay; CH3D for the Caloosahatchee Estuary; and EFDC for Florida Bay to name a few. Project-scale WASH123D models are also being developed for two South Florida CERP projects, the Biscayne Bay Coastal Wetlands (BBCW) and the C-111 Spreader Canal (C-111 SC) projects.

An advantage of developing a broadly applicable tool such as REMER would include the standardization of the modeling resources (i.e., regional, sub-regional, and/or project-specific) available to the PDTs. Such a move could reduce the time consuming processes of model identification, model selection, identification and acquisition of necessary data, and familiarization with different graphical user interfaces and model set-up procedures.

### **2.3.6 Operational Rules Inventory (ORI) Task Order Contract (TOC)**

A separate TOC with EarthTech (Prime Contractor) and their sub-contractors (Hydrologics and Synint) was executed on 30 September 2004. This TOC was initiated prior to the development of this PMP and the conceptualization of REMER, so it is not specifically tied to this PMP or its execution. The ORI TOC will be accomplished through two major components. The primary purpose of the first component (Phase I–ORI) is to produce a comprehensive inventory of operational and management rules (real or planned) imposed on relevant structures within the Central and South Florida (C&SF) system. It will establish organized and consolidated data bases of information for improved documentation and understanding of the present system and will provide the basis for designing and implementing equivalent features in new water management and operational tools, such as the REMER and other models presently being developed. This database will document both operational and management rules as well as existing operator discretion, judgment, and their skillful application in making the South Florida

water management system so successful. The second component of the ORI Task Order (Phase II–Preliminary Optimization-Based Model), will build on Phase I efforts and develop a more comprehensive, dynamic, and complex intelligent geographic information system (GIS) approach incorporating dynamic segmentation with structure operation and the formulation of a draft multi-objective optimization of present operator behavior. Phase I information will be directly applicable in the development of the REMER model. Phase II information may prove useful in future expansion of the REMER, beyond the execution of this PMP. Digital work products from each phase of work include databases of water control structure information and either a WEB-page or map server to depict the structures and identify and display all related data.

The first Phase I task in the ORI TOC, Control Objectives, will provide brief descriptions of the necessary operational objectives associated with C&SF water control structures of importance based on extensive interviews with CESAJ and SFWMD operators, planners, project managers, key individuals and stakeholder groups. This work effort is scheduled for completion by January 3, 2005. Task 2, Operational Objectives, in Phase I will produce a comprehensive list of operational objectives and a listing of control structures directly influencing each objective. Control strategies for meeting each operational objective will be described and cataloged. Mathematical statements describing the relationships between structure operation and achievement of each objective will be developed. This work effort is scheduled for completion by the end of February 2005. Phase I, Task 3, Existing Policies and Strategies, is scheduled for completion by the end of April 2005 and will incorporate findings from additional interviews with operators, past operational history, and policy guidance to determine policy based, practical, and historical balancing between operational objectives. The final Phase I task (Task 4A), will provide all Task 1, 2, and 3 information in Web-page format that meets all Department of Defense (DoD), U.S. Army, and SFWMD GIS standards. This summarization of Phase I work and effort is scheduled for completion by the end of May 2005. Each Phase I task will include both narrative text and complete EXCEL.XLS spreadsheets of all pertinent data. A Phase II effort may be initiated following the completion of Phase I work and is estimated to be complete within five months of its initiation.

## 3.0 PROJECT SCOPE

### 3.1 Project Goals and Objectives

The objective of the REMER modeling effort is to develop an engineering model for the evaluation of the surface and subsurface flows and their interaction for the CERP project area. This model will be defensible and a robust state-of-the-art numerical model that takes advantage of present day technology and capability to more thoroughly address and assess the multiple-interests and demands being placed on the management of South Florida water resources and ecosystem. The fully-coupled REMER application of the WASH123D modeling code will address the engineering and ecosystem hydrologic needs and requirements for an appropriately balanced and sustainable South Florida by modeling the significant hydrologic processes active within the model domain. This regional engineering model will be used to assess alternative evaluations from a regional perspective. It will be scalable for sub regional and project models and will be linkable to ecosystem models. The REMER will be a pure physics-based engineering model that incorporates up-to-date knowledge of watershed hydrology. While the operational movement of water is an integral part of REMER, this model is not intended to be used as a water distribution model. As such, REMER will be able to support other models such as water distribution models by identifying the importance and significance of any simplifying assumptions or empirical aspects of those models. This model could then be used to help identify the important parameters that either should be maintained or that can be simplified with minimal impact to the true reproduction of system processes and important system responses. The model could then be “tuned” to simplify the system and governing equations within acceptable and quantifiable limits. This approach will allow planners, operators, and managers desired information needed to balance the desired accuracy of solution with desired efficiency of computation and would allow one to quantify the quality and accuracy of results while providing the means and flexibility to more easily modify the developed tool to meet specific modeling and field requirements.

The REMER application of WASH123D modeling code provides the opportunity to fully assess the results of “abstractions” and simplifications. It provides an opportunity to assess impacts of reduced accuracy for the sake of faster run times. It would allow one to better quantify what the trade-offs are and provides a means of confirming and/or determining the level of balance achieved and the impact of the imposed “abstractions.” It could also be used in a hybrid fashion with other operational models by providing the means of training or adjusting model abstractions and/or simplifications.

This project began in mid-August 2004 and will provide a calibrated and validated model ready for alternative evaluation by June 2006. The approach being used to complete this work effort in the compressed timeframe is described below. The project team consists of members from CESAJ, ERDC, CERP IMC, and SFWMD. A detailed listing of PDT members is provided in Appendix A.

## 3.2 Description of Critical Parallel Modeling Activities

In order to meet the aggressive schedule of having a calibrated and validated model by June of 2006, it will be necessary to deviate from the standard sequential model development process and adopt a parallel development approach. There are seven critical taskings that will be performed in parallel or with significant overlap to meet the June 2006 deadline:

- PMP
- Model Requirements Evaluation Criteria
- Data Acquisition and Evaluation
- Conceptual Model Development
- Canal Structure Rating Curves and Operational Rules
- Model Development
- Model Code Enhancement

Each tasking is described in detail below along with staff involved and associated funded activities for ease of reference to additional information including schedules and funding levels:

### 3.2.1 PMP (ERDC/CESAJ-EN-HI/Others-Activities 1290, 1300, 1310, 1320, 1330, and 1340)

The purpose of the PMP is to describe how the work will be organized and what milestones are required to successfully complete the project within approved time and cost estimates. Primary development and approval of the PMP is the responsibility of CSAJ-EN-HI.

#### Deliverables:

This draft PMP represents the deliverable for this task and it is scheduled for completion by 30 November 2004. The final PMP is scheduled for execution by 31 December 2004.

### 3.2.2 Model Requirements Evaluation Criteria (ERDC-Activity 1370)

Regional models have been used extensively for a wide range of applications by a number of different entities. As regional system-wide model assessments are critical to the CERP implementation it was felt necessary to fully identify these requirements and develop appropriate model evaluation criteria. The model evaluation criteria for the CERP Regional Model are being developed by an interagency team coordinated by the IMC through their Regional Requirements Investigation Team (RMRIT) to investigate and document required capabilities. Inputs to these requirements and criteria were solicited from all the federal agencies and the cost-sharing partners of the CERP effort. The requirements and criteria will ensure that the physical aspects of the hydrologic processes are modeled correctly and the model is useful in addressing the system-wide evaluations required in CERP implementation.

Deliverables:

The first phase of the evaluation criteria is scheduled for completion in January 2005. A regional modeling requirement report will be prepared detailing the input from model users and customers and the type of modeling required to address CERP regional modeling. That document will be consulted to ensure that the REMER model development will satisfy CERP requirements. The final phase of RMRIT efforts will involve ranking the identified requirements into groups based on conceived importance and a summary of the team findings. This work is scheduled for completion by 30 January 2005.

**3.2.3 Data Acquisition and Evaluation (ERDC-Activities 1380, 1390,1400, 1410, 1420; CESAJ-EN-DT–Activity 1610; CESAJ-EN-HW–Activity 1600) (See Project Milestones 3.6.1–3.6.3)**

This task will compile and evaluate all data needed for the regional model. The data are the basis from which the model is developed and calibrated. This will require considerable effort for the first six months of the project but will be ongoing throughout the project. Except where noted otherwise, ERDC will have the primary responsibility for data acquisition, evaluation, compilation, and application. The steps involved in this task include:

- Data compilation
- Evaluate data for completeness, accuracy, and data interrelationships
- Conversion of all necessary data to correct coordinate system (X, Y, and Z) (North American Horizontal Datum 1983 [NAD 83], Florida State Plane, East and North American Vertical Datum 1988 [NAVD88]) (See CESAJ-EN-HI MFR: Datum Decision Document dated 06 December 2004). All geospatial data to be directly used in the modeling effort will be provided in the appropriate datum and with appropriate quality assurance/quality control (QA/QC) and metadata that meets Federal and CERP metadata standards. The QA/QC, datum conversion, and metadata will be the responsibility of the assigned office (see Table 4.1 and Appendices C and D) and their delivery is required as scheduled to maintain the tight model development project completion schedule.

As with all activities, including data acquisition and evaluation, coordination especially between the various Agencies and offices, is to take place through a central point of contact at CESAJ-EN-HI, presently either Mr. Mitch Granat or Mr. Russ Weeks.

Where survey accuracy data is required and available (primarily at water control structures) it will be used; when such data is not available, it will have to be obtained through new survey data collection. CESAJ-EN-DT will have the primary responsibility for the collection of the required new survey information in NAVD88 and NAD83 (Activity 1610). This data collection will generally be required at identified primary and secondary structures throughout the modeling domain as jointly identified by CESAJ-EN-DT, CESAJ-EN-HW, and ERDC staff. CESAJ-EN-HW staff will be responsible for the appropriate conversions of all operating rules, rating curves, and regulation schedules in the appropriate datum (Activity 1600).

As discussed in the Datum Decision Document, those locations not requiring survey accuracy, either VERTCON 2.0 or VERTCON 2.5 (pending approval by NGS), will be used for the datum conversion requirements. The remaining data required for this modeling effort consists of two types. The first is spatial data that remain fixed over time and consists of:

- Primary Canal Network and Important Secondary Canal Networks and their hydraulic properties (location, x-sections, roughness, bottom elevation, definition of banks). These are the canals that will be incorporated in to the REMER model by ERDC staff. Available SFWMD SFRSM databases will be used by ERDC for modeling information purposes.
- Hydraulic structures (locations, dimensions, hydraulic properties, standard operating procedures). This general information will be provided to ERDC for modeling information purposes through the ORI TOC and the already provided SFWMD digital structures database.
- Geologic model (hydrostratigraphy, aquifers, aquifer properties, geophysical logs, surface soils). CESAJ-EN-G will provide and work with ERDC on the hydrogeology data aspects of model development.
- Public and private water supply (from both surface and subsurface sources), including available individual well characteristic information, such as screen level and pumping capacity.
- Hydrography (lakes, ponds, bogs, mine pits, secondary and tertiary canals.)
- Topography (CESAJ-IM-I [partial Activity 1270] and CESAJ-EN-DT [partial Activity 1280]) will work together in preparing the required consistent topographic mosaic coverage needed for the REMER model development.
- Anthropogenic features (roads, levees, bridges, culverts, urban areas with storm water drainage, managed agriculture regions with special drainage features)
- Land use and land cover
- Monitoring network for flow, stage, and water quality

The other types of data are time series data for specific spatial locations. ERDC will have the overall responsibility for time series data conversions and applications. These data consist of:

- Precipitation
- Potential ET (or associated parameters such as temperature and solar radiation)
- Canal flow and Canal stage
- Overland stage
- Groundwater elevations
- Tide
- Salinity
- Operations (regulation schedules, lake stage, gate openings, pumping schedule); CESAJ-EN-HW (Activity 1600) to provide appropriate information in NAVD88 to ERDC for incorporation in to the REMER model.

For all data, the meta data (i.e., the data about the data) will need to be evaluated by each office performing related work. The items of extreme importance include the coordination datum used by the data and any QA/QC evaluations of the data. If possible, only data that have been reviewed and evaluated (QA/QCed) by one of the agencies



associated with the CERP project will be used. All new data and any data manipulations should be fully documented following appropriate Federal and CERP metadata standards.

Where data exists from other modeling efforts, those data will be used if possible, as long as the source data has been identified, the data has not been altered during calibration, and the data quality is verifiable.

Deliverables:

To document the data compilation, three assessment reports describing available data, gaps, and the preliminary analysis performed will be prepared and delivered according to Section 3.6. These reports will be prepared by ERDC and will include related geologic appendices prepared by CESAJ-EN-G. A consistent NAVD88 topographic mosaic coverage will be prepared by CESAJ-EN-DT and CESAJ-IM-I. CESAJ-EN-DT will also be responsible for any new survey associated work as required. CESAJ-EN-HW will provide data that are appropriately converted to NAVD88 operating rules, rating curves, and regulation schedules.

**3.2.4 Conceptual Model Development (ERDC/CESAJ-EN-GG/GS–Activities 1430, 1440, 1450, 1460, 1620) (See Project Milestones 3.6.4)**

Both a geologic and a hydrologic conceptual model for the entire model domain will be developed. The geologic conceptual model will translate the hydrostratigraphy to model layers and the hydraulic properties of each layer will be assigned aquifer parameters. The hydrologic/hydraulic conceptual model will define the physical and management processes that will be included in the model. Part of this task includes development of the model boundary and initial conditions, time step, period of record, aggregation of subscale processes, representation of management and operations in the model, and calibration and validation targets. Some of these aspects will be refined during model development and calibration. ERDC will have the lead responsibility in the completion of the conceptual model and will be supported by CESAJ-EN-G and CESAJ-EN-HI (IMC) staff.

This regional model domain will encompass the area from above LO south to Florida Bay, and from the Atlantic Coast to the Gulf of Mexico. This area is about 8,000 square miles. The model domain is shown in Appendix B.

Specific aspects of the geologic conceptual model development will be undertaken by CESAJ-EN-GG staff that will define the conceptual hydrogeologic framework of the surficial aquifer systems in south Florida and break the framework out into layers for model development. This will be based on the synthesis and interpretation of existing hydrogeologic and geologic data, and identify data gaps and areas requiring additional data analysis. The framework will serve as a basis for the numerical model development.

The specific scope of work for the CESAJ-EN-GG staff will be to develop the conceptual hydrogeologic framework of the surficial aquifer systems in the study area by defining the hydrostratigraphic layers and aquifer parameters. This will be accomplished in three steps. First, the overall geologic framework will be established detailing key

stratigraphic zones and geologic structures (i.e., karst and faults). The second step will be to establish and evaluate the overall hydrogeologic framework (i.e., flow zones and confining units) that resides within the geologic framework. The third step will be to divide the hydrostratigraphy into layers and assign hydraulic parameters (i.e., hydraulic conductivity and leakance) for each layer. The ambient conditions for model calibration will also be developed.

Hydrogeologic and geologic data to be compiled and reviewed include lithologic logs, down hole and surface geophysical logs, aquifer performance tests (APTs), groundwater monitoring data, and published and unpublished regional reports and maps. Emphasis will be on identifying – and where possible – rectifying areas of inconsistency and data gaps. Compiled data will be formatted for input into the database used for the modeling effort.

The analyses will focus on flow systems, location, nature and extent of boundaries, aquifers, and confining units. Analyses will also specifically address questions critical to establishing confidence in the modeling (e.g. continuity of flow zones within the aquifer, and scale dependency of parameters such as permeability, dispersivity and leakance). It is envisioned that only existing information will be utilized; however, any new data that becomes available during the course of this work will be incorporated, where feasible.

During the course of the model development effort, the model results will be compared to the conceptual framework and adjustments to the hydrogeologic parameters in the model will be recommended, as necessary.

The deliverable for the conceptual framework will be a technical memorandum (TM) summarizing the existing data review, identification of data and interpretative gaps, problematic areas and potential interpretations of the groundwater flow systems, preliminary GIS maps, and cross-sections. A complete QA/QC will be provided for all geologic data, and appropriate metadata documenting the data and its data quality will also be provided. This data will be provided in the appropriate datum and at the scheduled delivery times.

The hydrologic/hydraulic conceptual model will involve the definition of the canals and hydraulic structures to be explicitly incorporated in the model. ERDC has the sole responsibility for this activity (Activity 1440). The canal system of South Florida involves a wide range of canal types that are built for different purposes. The canal network and associated structure will be evaluated and primary and secondary canals that exert considerable control on the flow system will be included explicitly in the model. Other small secondary and tertiary canals, local structures, flood control drainage districts, and agriculture basins will be evaluated and an appropriate methodology for aggregating their effect on the drainage pattern will be defined.

In this task, primary structures will be evaluated and the most appropriate method for simulating the different types of structures will be identified (e.g., rating curve, physical dimensions, and time step required for stability). The regulation schedule of the different hydrologic components of the system (e.g., LO, Water Conservation Areas [WCAs],

Reservoirs, and rainfall driven operation) will be examined and a methodology for incorporating these schedules in the model will be identified.

The methodology used to represent potential ET and actual ET will be reviewed together with available data. Depending on the availability of solar radiations and/or temperature and the most appropriate method that yields consistent results with current models and/or available data will be identified in this task.

Other hydrologic/hydraulic components and available data will be evaluated to identify the most appropriate method for representing processes such as levee seepage, overland flow in wetlands, micro-topography control, urban drainage, agriculture processes (demand, irrigation/drainage, and retention/detention), public water supply, and domestic water supply. Aggregation of these processes on the regional scale will be required to simplify the model as well because of the lack of data. The conceptual model will layout the approach used in the physically based model to address these subscale processes.

Finally, model calibration strategy will be developed in this task where the calibration and verification/validation targets and period of record will be identified and the period of records used in/for a split-sample calibration/validation will be defined. The targets will include both flow and stage targets. The task will also define the metrics and accuracy envisioned from the model.

*Deliverables:*

See Section 3.6 for specific delivery dates.

**3.2.5 Canal Structures Rating Curves and Operational Rules (ERDC/CESAJ-EN-HW–Activities 1480 & 1600) (See Project Milestones 3.6.5)**

This task will involve the understanding and development of the operational rule-rating curve for LO and for all primary and major secondary canal structures. The ongoing ORI TOC described in Section 2.3.6 will be collecting and consolidating this information in a populated database that will be utilized during REMER development. The ERDC regional modeling effort will take the results of the ORI contract effort and develop the input for the rating curves and operational rules in the numerical model. This contract information should be available as scheduled to meet the needs of this modeling effort. ERDC and the IMC will be kept informed concerning progress and deliverables from this contract. CESAJ-EN-HW efforts in converting operational rules, rating curves, and regulation schedules not already available in NGVD88 will be provided to ERDC no later than 31 May 05 for revision and final implementation in REMER model.

*Deliverables:*

See Section 3.6 for specific delivery dates.

### **3.2.6 Model Development** (ERDC–Activities 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560) (See Project Milestones 3.6.6–3.6.6.5)

This task includes the development of the numerical mesh and involves the discretization of 1-D, 2-D, and 3-D elements of the system (canals, wetlands, groundwater, lakes, reservoirs). Model input and model computation issues such as time interval and canal operations are included in this effort. Also included in this task is model calibration and validation.

This task works in joint partnership with the conceptual model so that processes identified as part of that task can be included in the numerical model. Mesh development should be started early in the project timeframe so that model resolution and run time issues can be evaluated and considered.

For calibration and validation of the model, the data from the period 1981 through 2000 will be evaluated. The representative wet, dry, and average years will be determined for model calibration and validation. Also, the impacts of transition periods between the wet, dry, and average years will be considered.

A NSM will be developed using the same model (mesh and conceptual geologic model) but with natural conditions. As with the SFNSM, this natural system will be designed to simulate the hydrologic response of a pre-drained Everglades system. To ensure adequate understanding of REMER, the IMC will take the lead on the development of the REMER NSM with considerable involvement from ERDC staff. This task will allow the IMC staff to gain a fuller appreciation of REMER and be able to put the model to use in the mandated function of the IMC as the responsible entity for all CERP regional modeling. The REMER NSM would likely be scheduled to start in November 2005. This would provide the IMC staff the opportunity of desired hands on REMER training while providing a value added CERP modeling tool. The development of this NSM model is not part of the development required to have a calibrated regional model completed by June 2006. Thus the completion of this model will depend on the availability of resources (mainly time) beyond what is required for the calibrated model.

#### *Deliverables:*

See Section 3.6 for specific delivery dates

### **3.2.7 Model Code Enhancement** (ERDC–Incorporated in Activities 1490, 1500, 1510, 1520, 1530, 1540, 1550, 1560)

Some code enhancements to the WASH123D capabilities are anticipated for a project of this size. These enhancements will be identified early in the conceptual model definition process and then scheduled. A present potential code enhancement includes a more robust ET formulation consistent with the current methodology used in south Florida and with available data, operation of individual structure, regional management capabilities (regulation schedules and rainfall driven operations), and budget tools for detailed analysis of basins water budget. Other possible enhancements include lake or reservoir operating rules, ensure canal structure and operating rules function properly, and enhance

the non-reactive multi-species transport. Enhancements in the WASH123D graphical user interface (GUI) and the parallel code are also necessary, so that both the present modeling work and the future REMER applications can be made much more effectively and efficiently.

*Deliverables:*

A letter report summarizing the code enhancements will be prepared. This report will be due on 27 June 2006.

### **3.3 Project Constraints and Assumptions**

#### **3.3.1 Time Constraints**

The most significant constraint for successful implementation of this project is the 20 month timetable for delivery of a calibrated and validated model. As described above in section 3.2, the standard model development process will not allow enough time to meet this schedule, so many of the steps will have to be implemented in parallel. Delays in any one activity may not slow down the entire project, but they will all have to be completed before the model can be calibrated and validated. Based on recent model development exercises in southern Florida, the data collection and evaluation activity will have to be managed carefully and intensively to ensure that quality data are available when needed to initiate model set-up. Successful and on-time completion of the ORI TOC is also critical to the model development schedule of the REMER. Another major time constraint is the resources (both time and funding) that will be required in completing the necessary conversions of all data, rules, and regulation schedules to the appropriate vertical and horizontal datum. A better understanding of the resources involved will not occur until the actual conversion efforts have been initiated.

#### **3.3.2 Budget Constraints**

There do not appear to be any budget constraints at present. However, if the Continuing Resolution Authority does not allow for the provision of adequate funding, it could cause project delays.

#### **3.3.3 Resource Constraints**

ERDC currently maintains a fixed pool of experienced modeling experts familiar with WASH123D. In addition to the new REMER effort, these modelers have existing obligations for projects such as BBCW and C-111 SC. It will be important to effectively schedule the time demands so that existing modeling efforts can be completed while this new modeling effort is being undertaken. If unexpected model development difficulties and/or new requirements are identified, ERDC will also have the availability of assigning more technical support through a virtual USACE expert modeling staff through other Laboratory facilities and Districts or through existing Federal TOC. These new and/or unanticipated requirements may require additional funding to cover associated new costs.

### 3.4 Steering Committee

The REMER model development effort will demand considerable time and resources to complete. The development effort will be under close scrutiny from SFWMD, USGS, and other agencies. In addition, the proposed schedule does not allow many wrong decisions, approaches, or scope deviations. Therefore, it is proposed that an internal REMER Model Development Steering Committee (RMDSC) be established for the life of the project. The RMDSC will be chartered to provide leadership in the model development effort. The RMDSC will consist of approx. eight persons or less including representatives of the ERDC, IMC, CESAJ, Department of the Interior (DOI), and SFWMD. Five "core" team members would be permanent members of this group. Three other members would be rotating "Ad-hoc" members dependent on work phase and/or task underway. For instance, in the early data collection phase, the ad-hoc team may contain one or more hydrogeologists in addition to the one envisioned as part of the core team. This group would ensure that coordination of the model development effort occurs frequently. This group would meet on a quarterly basis or more often as necessary and would be responsible for the following:

- Schedule Monitoring to ensure milestones are met
- Budget oversight to ensure spending is per PMP and P2
- Deliverables produced meet required schedule and consist of the required quality
- Resolution of technical model development issues/disagreements
- Coordination of efforts with RECOVER, IMC, and other agencies
- Provide a forum to discuss scope changes or schedule changes

The team would also provide reporting back to the USACE Project Review Board (PRB) and the SFWMD CRB. One member of the team would be assigned as the overall project engineer. The Chief, Hydraulics and Hydrology Branch, Engineering Division, would chair the meetings of the RMDSC and be responsible for final reporting. Present members of the RMDSC are anticipated to include Jim Vearil (Project Manager), Mitch Granat (Project Engineer), Russ Weeks, Sean Smith, Chris Brown, and Rory Sutton.

### 3.5 Independent Technical Review (ITR)

As with the Steering Committee, due to the sensitivity of the REMER development, an outside independent expert technical model evaluation group will be established to conduct progress and status reviews of ongoing model development efforts. This group will be established through the IMC and will likely consist of five totally independent modeling experts from the academic field who are not presently involved or tied to SFWMD or USACE contracting arrangements. It is envisioned that this MEG would be involved with report reviews and additional oversight of progress on an approximately semi-annual basis. The MEG would be separately funded through the IMC, from funds associated with the REMER model development.

### **3.6 Interim and Final Project Milestones \***

The REMER project will be actively managed throughout its development and implementation phases. Delivery and careful review of interim products and project milestones will be one of the key methods used as critical tools and decision points for continued model development efforts.

#### **3.6.1 Data Acquisition and Evaluation**

##### **3.6.1.1 Information Data Reports**

Preliminary Assessment 1 (Activity 1380)–mid January 2005

Intermediate Assessment 2 (Activity 1390)–March 2005

Final Assessment Report (Activity 1400)–June 2005

NAVD88 Structure Surveys Completed (Activity 1610)–March 2005

Operating Rules, Rating Curves, Regulation Schedule Converted to NAVD88–  
(Activity 1600)–May 2005

#### **3.6.2 Spatial Data**

##### **3.6.2.1 Interim Draft Report for Spatial Data (Activity 1400)–June 2005**

##### **3.6.2.2 Draft Report, all Spatial Data (Activity 1410)–December 2005**

#### **3.6.3 Times Series Data**

##### **3.6.3.1 Interim Draft Report for Time Series Data (Activity 1400)–June 2005**

##### **3.6.3.2 Draft report, all Time Series Data (Activity 1420)–January 2006**

#### **3.6.4 Conceptual Model Development**

##### **3.6.4.1 Draft Report, Informational Report: Geologic Data (Activity 1430)– February 2005**

##### **3.6.4.2 Draft Report, Initial Geologic Concept Model (Activity 1450)–June 2005**

##### **3.6.4.3 Draft Report, Final Geologic Concept Model (Activity 1460)–December 2005**

##### **3.6.4.4 Draft Report, Hydrologic Processes Concept Model (Activity 1440)–March 2005**

#### **3.6.5 Canal Structure Operational Rules (OR) and Rating Curves (RC)**

##### **3.6.5.1 ORI Progress Report/Data Availability Check Point (Activity 1470)– February 2005**

##### **3.6.5.2 Operating Rules, RC, Regulation Schedule Converted to NAVD88 (Activity 1600)–May 2005**

##### **3.6.5.3 Draft Report, OR and RC Implementation (Activity 1480)–December 2005**

**3.6.6 Model Development****3.6.6.1 Draft Report, Initial Mesh (Activity 1490)–April 2005****3.6.6.2 Draft Report, Initial Numerical Model (Activity 1500)–June 2005****3.6.6.3 Draft report, Preliminary Model Sensitivity (Activity 1510)–October 2005****3.6.6.4 Draft Report, Model Documented for Calibration (Activity 1520)–  
December 2005****3.6.6.5 Draft Report, Model Calibration (Activity 1530)–April 2006****3.6.6.6 Draft Report, Model Validation (Activity 1540)–June 2006****3.6.6.7 Draft Technical Report, Study Documentation (Activity 1550)–June 2006**

\* Refer to Appendices for additional activity information



## 4.0 SUMMARY OF AGENCY RESPONSIBILITIES

**TABLE 4-1: WORK DISTRIBUTION BY TOPIC**

<b>Work Topic</b>	<b>Responsible Agency</b>	<b>Comment/Rationale</b>
<b>PMP Development</b>	USACE-JAX/IMC/ERDC	CESAJ-EH-HI has the lead
<b>Model Evaluation Criteria</b>	USACE-JAX/IMC	CESAJ-EN-HI -IMC has the lead
<b>Data Acquisition and Evaluation</b>	USACE-JAX/IMC/ERDC	ERDC has the primary lead CESAJ-EN-DT has survey lead CESAJ-EN-HW has structure datum conversion lead
<b>Conceptual Model Development</b>	USACE-JAX/IMC/ERDC	ERDC has the lead
<b>Canal Structure Rating Curve</b>	USACE-JAX/ERDC	CESAJ-EN-HW for conversion ERDC for model implementation
<b>Model Development</b>	USACE-ERDC	ERDC has the lead
<b>Code Enhancements</b>	USACE-ERDC	ERDC has the lead

## 5.0 PROJECT CHANGES

### 5.1 List of PMP Updates and Revisions

This section and Appendix K are reserved to document future updates and revisions to this PMP.

### 5.2 Changes to Project Schedule and Cost

#### 5.2.1 Changes to Project Schedule

**TABLE 5-1: PROJECT SCHEDULE**

	<b>**Baseline</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>PMP Development</b>	December 30, 2004			
<b>Model Evaluation Criteria</b>	January 30, 2005			
<b>Data Acquisition and Evaluation</b>	January 31, 2006			
<b>Conceptual Model Development</b>	December 30, 2005			
<b>Canal Structure Rating Curve</b>	December 30, 2005			
<b>Model Development</b>	June 30, 2006			
<b>Code Enhancements</b>	June 30, 2006			

### 5.2.2 Changes in Project Cost Estimates

**TABLE 5-2A: TOTAL PROJECT ERDC COST SUMMARY (FISCAL YEAR [FY] 05)**

	<b>**Baseline</b>	<b>Contingency</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>PMP Development</b> (1290; 1300; 1330)	\$60,000	\$20,000			
<b>Model Evaluation Criteria</b> (1370)	\$20,000	\$0			
<b>Data Acquisition and Evaluation</b> (1380; 1390;1400; 1410; 1420)	\$370,000	\$50,000			
<b>Conceptual Model Development</b> (1430; 1440; 1450; 1460)	\$279,600	\$50,000			
<b>Canal Structure Rating Curve</b> (1480)	\$120,400	\$30,000			
<b>Model Development</b> (1490; 1500; 1510)	\$360,000	\$20,000			
<b>Code Enhancements</b> (1500; 1510; 1540)	\$220,000	\$20,000			
<b>Travel</b> (1580)	\$36,000				
<b>REMER Liaison</b> (60%) (1360)	\$150,000				
<b>REMER Liaison/Travel</b> (1580)	\$11,000				
<b>FY 05 Total</b>	\$1,627,000	\$190,000			

**TABLE 5-2B: TOTAL PROJECT ERDC COST SUMMARY (FY 06)**

	<b>**Baseline</b>	<b>Contingency</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>PMP Development</b>	\$0	0			
<b>Model Evaluation Criteria</b>	\$0	\$0			
<b>Data Acquisition and Evaluation</b> (1410; 1420)	\$70,000	\$10,000			
<b>Conceptual Model Development</b> (1460)	\$64,600	\$20,000			
<b>Canal Structure Rating Curve</b> (1480)	\$120,400	\$20,000			
<b>Model Development</b> (1510; 1520; 1530)	\$360,000	\$50,000			
<b>Code Enhancements</b> (1500; 1510; 1540)	\$120,000	\$20,000			
<b>Travel</b> (1580)	\$30,000				
<b>REMER Liaison</b> (60%) (1360)	\$150,000				

<b>REMER Liaison/Travel</b> (1580)	\$11,000				
<b>FY 06 Total</b>	\$926,000	\$120,000			

**TABLE 5-2C: TOTAL PROJECT ERDC COST SUMMARY (FY 05 +FY 06)**

	<b>**Baseline</b>	<b>Contingency</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>PMP Development</b> (1290; 1300; 1330)	\$60,000	\$20,000			
<b>Model Evaluation Criteria</b> (1370)	\$20,000				
<b>Data Acquisition and Evaluation</b> (1380; 1390; 1400; 1410; 1420)	\$440,000	\$60,000			
<b>Conceptual Model Development</b> (1430; 1440; 1450; 1460)	\$344,200	\$70,000			
<b>Canal Structure Rating Curve</b> (1480)	\$240,800	\$50,000			
<b>Model Development</b> (1490; 1500; 1510; 1540)	\$720,000	\$70,000			
<b>Code Enhancements</b> (1500; 1510; 1540)	\$340,000	\$40,000			
<b>Travel</b> (1580)	\$66,000				
<b>REMER Liaison</b> (1360)	\$300,000				
<b>REMER Liaison/Travel</b> (1580)	\$22,000				
<b>FY 05 + FY 06 Total</b>	\$2,553,000	\$310,000			

**TABLE 5-3A: TOTAL PROJECT OTHER IN-HOUSE COST SUMMARY (FY 05)**

	<b>**Baseline</b>	<b>Contingency</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>CESAJ-EN-HI Coordination</b> (1360)	\$150,000				
<b>CESAJ-EN-HI(IMC) Coordination</b> (1360)	\$77,000				
<b>CESAJ-EN-HI Travel</b> (1350)	\$12,000				
<b>CESAJ-EN_HW Rules Data Conversion</b> (1600)	\$85,000				

<b>CESAJ-EN-DT Topo Coordination (1280)</b>	\$28,000				
<b>CESAJ-EN-DT NAVD88 Data Conversion (16001610)</b>	\$538,000				
<b>CESAJ-EN-GS Conceptual Model Development (1430; 1450; 1460)</b>	\$23,000				
<b>CESAJ-EN-GG Conceptual Model Development (1430; 1450; 1460)</b>	\$176,820				
<b>CESAJ-EN-G Management (1260)</b>	\$13,970				
<b>CESAJ-EN-G Travel (1250)</b>	\$4,500				
<b>CESAJ-IM-I GIS Technical Support (1270)</b>	\$32,000				
<b>CESAJ-IMC ITR/MEG (1590)</b>	\$120,000				
<b>FY 05 Total</b>	\$1,260,290				

**TABLE 5-3B: TOTAL PROJECT OTHER IN-HOUSE COST SUMMARY (FY 06)**

	<b>**Baseline</b>	<b>Contingency</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>CESAJ-EN-HI Coordination (1360)</b>	\$150,000				
<b>CESAJ-EN-HI(IMC) Coordination (1360)</b>	\$77,000				
<b>CESAJ-EN-HI Travel (1350)</b>	\$12,000				
<b>CESAJ-EN-GS Geotech Conceptual Model Development &amp; Coordination (1460; 1620)</b>	\$11,000				
<b>CESAJ-EN-GG Geotech Conceptual Model Development &amp; Coordination (1460; 1620)</b>	20,160				
<b>CESAJ-EN-G Management (1260)</b>	2,200				
<b>CESAJ-EN-G Travel (1250)</b>	\$3,000				

<b>CESAJ-IM-I GIS Technical Support (1270)</b>	\$32,000				
<b>CESAJ-IMC ITR/MEG (1590)</b>	\$120,000				
<b>FY 06 Total</b>	\$427,360				

**TABLE 5-3C: TOTAL PROJECT OTHER IN-HOUSE COST SUMMARY (FY 05 + FY06)**

	<b>**Baseline</b>	<b>Contingency</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
<b>CESAJ-EN-HI Coordination</b> (1360)	\$300,000				
<b>CESAJ-EN-HI(IMC) Coordination</b> (1360)	\$154,000				
<b>CESAJ-EN-HI Travel</b> (1350)	\$24,000				
<b>CESAJ-EN-HW Rules Data Conversion</b> (1600)	\$85,000				
<b>CESAJ-EN-DT Topo Coordination</b> (1280)	\$28,000				
<b>CESAJ-EN-DT NAVD88 Data Conversion</b> (1610)	\$538,000				
<b>CESAJ-EN-GS Geotech Conceptual Model/Coordination</b> (1290; 1300; 1330; 1620)	\$34,000				
<b>CESAJ-EN-GG Geotech Conceptual Model/Coordination</b> (1290; 1300; 1330; 1620)	\$196,980				
<b>CESAJ-EN-G Management</b> (1260)	\$16,170				
<b>CESAJ-EN-G Travel</b> (1250)	\$7,500				
<b>CESAJ-IM-I GIS Technical Support</b> (1270)	\$64,000				
<b>CESAJ-IMC ITR/MEG</b> (1590)	\$240,000				
<b>FY 05 &amp; FY 06 Total</b>	\$1,687,650				

**TABLE 5-4 TOTAL PROJECT (ERDC & OTHER IN-HOUSE) COST SUMMARY**

	<b>**Baseline</b>	<b>Contingency (ERDC only)</b>	<b>**Current Approved</b>	<b>Forecast</b>	<b>Actual</b>
FY 05	\$2,887,290	\$190,000			
FY 06	\$1,353,360	\$120,000			
FY 05 + FY 06	\$4,240,650	\$310,000			

## **6.0 FINANCIAL MANAGEMENT**

### **6.1 Project Cost Estimates**

A planning level cost estimate for this Modeling Scope of Work is provided in Appendix E. The cost of the phase of this project was estimated by the model development team based on the scope of work and work breakdown structure with appropriate resource costs applied to the activities.

A Total Project Cost Summary is provided in Appendix E, Tab A.



## **7.0 UNIQUE FACTORS**

- At this time there are no unique factors that have not been discussed in the previous text of this plan.

## REFERENCES

Yeh, G.T., Cheng, H. P., Huang, G., Zhang F., Lin, H.C., Edris, E., and Richards, D., 2003). “A Numerical Model of Flow, Heat Transfer, and Salinity, Sediment, and Water Quality Transport in Watershed System of 1-D Stream-River Network, 2-D Overland Regime, and 3-D Subsurface Media (WASH123D: Version 2.0)”, DRAFT Technical Report (November 2003), US Army Corps of Engineers, Engineer Research and Development Center, 3909 Hall Ferry Road, Vicksburg, MS 39180-6199, USA.)

WRDA or in the Design Agreement between the Department of The Army and the South Florida Water Management District for Design of Elements of the Comprehensive Plan for the Everglades and South Florida Ecosystem Restoration Project (USACE and SFWMD, 2000).

Interagency Modeling Center Programmatic Project Management Plan (USACE and SFWMD, January 2004)

South Florida Water Management District, May 2003. A Pseudo Cell Manual for the Regional Simulation Model (RSM).

**APPENDIX A: LIST OF REMER TEAM MEMBERS**

TABLE A-1: LIST OF REMER TEAM MEMBERS

NAME	JOB TITLE	E-MAIL	PHONE
<b>US ARMY CORPS OF ENGINEERS, JACKSONVILLE DISTRICT</b>			
Russ Weeks	CESAJ-EN-H	russell.weeks@saj02.usace.army.mil	904-232-1559
Mitch Granat	CESAJ-EN-H	mitch.a.granat@saj02.usace.army.mil	904-232-1839
Chris Brown	CE-CESAJ-EN-G	Christopher.j.brown@saj02.usace.army.mil	904-232-1008
Mike Fies	CE-CESAJ-EN-G	michael.w.fies@saj02.usace.army.mil	904-232-1267
Dr. Maged Hussein	CE-CESAJ-EN-H	<a href="mailto:maged.m.hussein@saj02.usace.army.mil">maged.m.hussein@saj02.usace.army.mil</a>	561-682-2210
Dr. Christiana Aguirre	CESAJ-EN-H	christiana.g.aguirre@saj02.usace.army.mil	561-682-2227
Trent Ferguson	CESAJ-EN-H	Trent.l.ferguson@saj02.usace.army.mil	904-232-1749
Dave Robar	CESAJ-EN-D	David.j.robar@saj02.usace.army.mil	904-232-1603
Jeff Navaille	CESAJ-EN-D	Jeffrey.L.Navaille @saj02.usace.army.mil	904-232-2499
Rory Sutton	CESAJ-IM-I	Rory.J.Sutton @saj02.usace.army.mil	904-232-2473
Charlie Fales	CESAJ-DP-P	Charles.D.Fales @saj02.usace.army.mil	904-232-1017
Jim Vearil	CESAJ-DR-R	James.W.Vearil @saj02.usace.army.mil	904-232-1591
Elmar Kurzbach	CESAJ-DP-R	Elmar.G.Kurzbach @saj02.usace.army.mil	904-232-2325
Liz Manners	CESAJ-DP-R	Lizabeth.R.Manners @saj02.usace.army.mil	904-232-3923
COL Carpenter	CESAJ-DE	Robert.M.Carpenter @saj02.usace.army.mil	904-232-2241
Frank Metzler	EPJV	frank.t.metzler@saj02.usace.army.mil	904-232-1009
Dr. Earl Edris	CEERD-HF-H	Earl.V.Edris@erdc.usace.army.mil	601-634-3378
Dr. Jerry Lin	CEERD-HF-H		601-634-3023
Dr. Pearce Cheng	CEERD-HF-H	Pearce.Cheng@us.army.mil	601-634-3699
Chuck Tate	CEERD-HF-H	Charles.H.Tate@erdc.usace.army.mil	601-634-2120
Darla McVan	CEERD-HF-E	Darla.C.McVan@erdc.usace.army.mil	601-634-2869
COL James Rowan	CEERD-DE	James.R.Rowan.COL@erdc.usace.army.mil	601-634-2513
SOUTH FLORIDA WATER MANAGEMENT DISTRICT			
Rich Sands SFWMD Liaison	Jacobs Engineering		561-682-2902
<b>GOVERNMENT AGENCIES</b>			
DOI			
FWS			
Counties			
Tribes			

## **APPENDIX B: PROJECT MAP**

**FIGURE B-1: PROJECT LOCATION MAP**

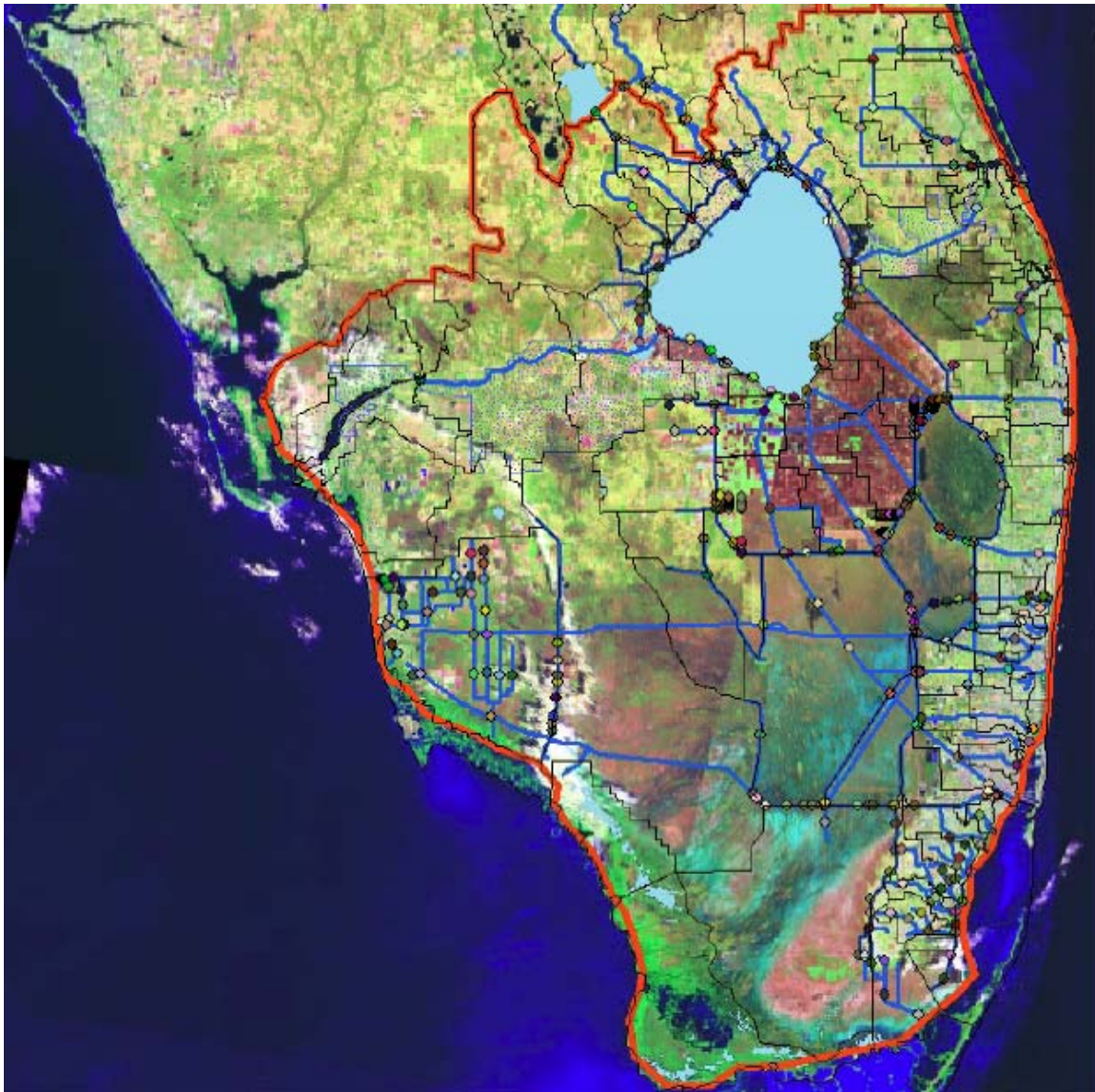
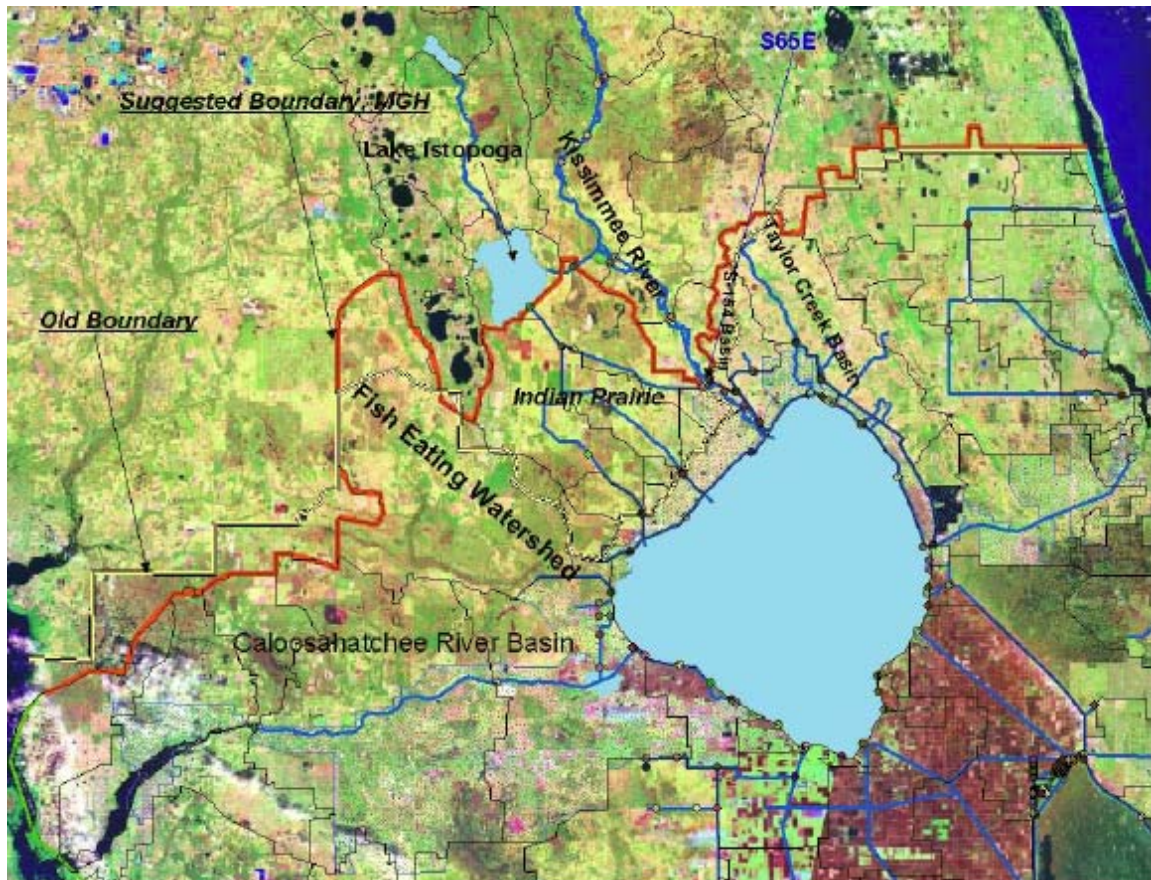




FIGURE B-2: PRESENT PROPOSED NORTHERN MODEL DOMAIN



## **APPENDIX C: WORK BREAKDOWN STRUCTURE**

### **TAB A–Activity Listing by WBS**

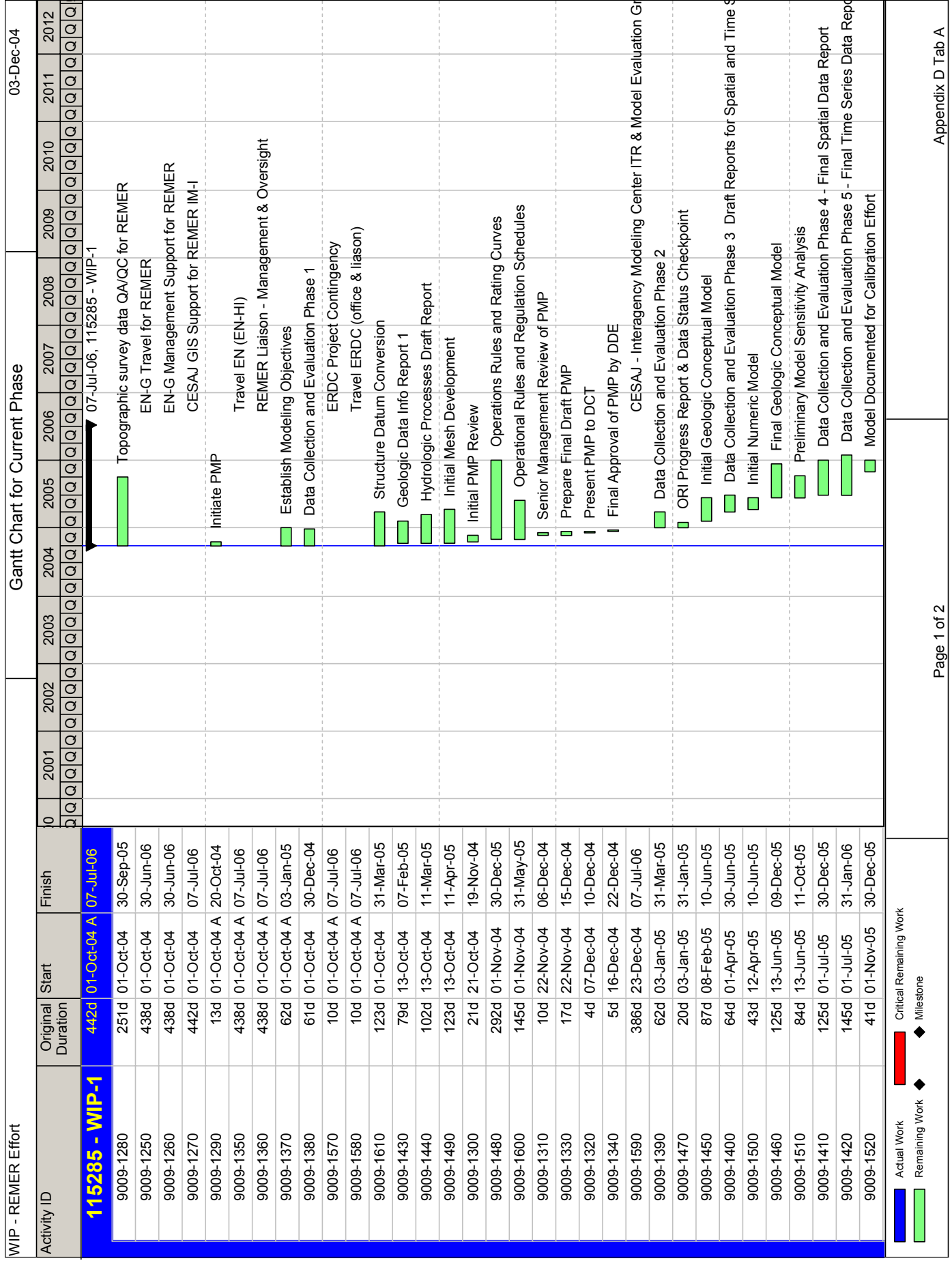


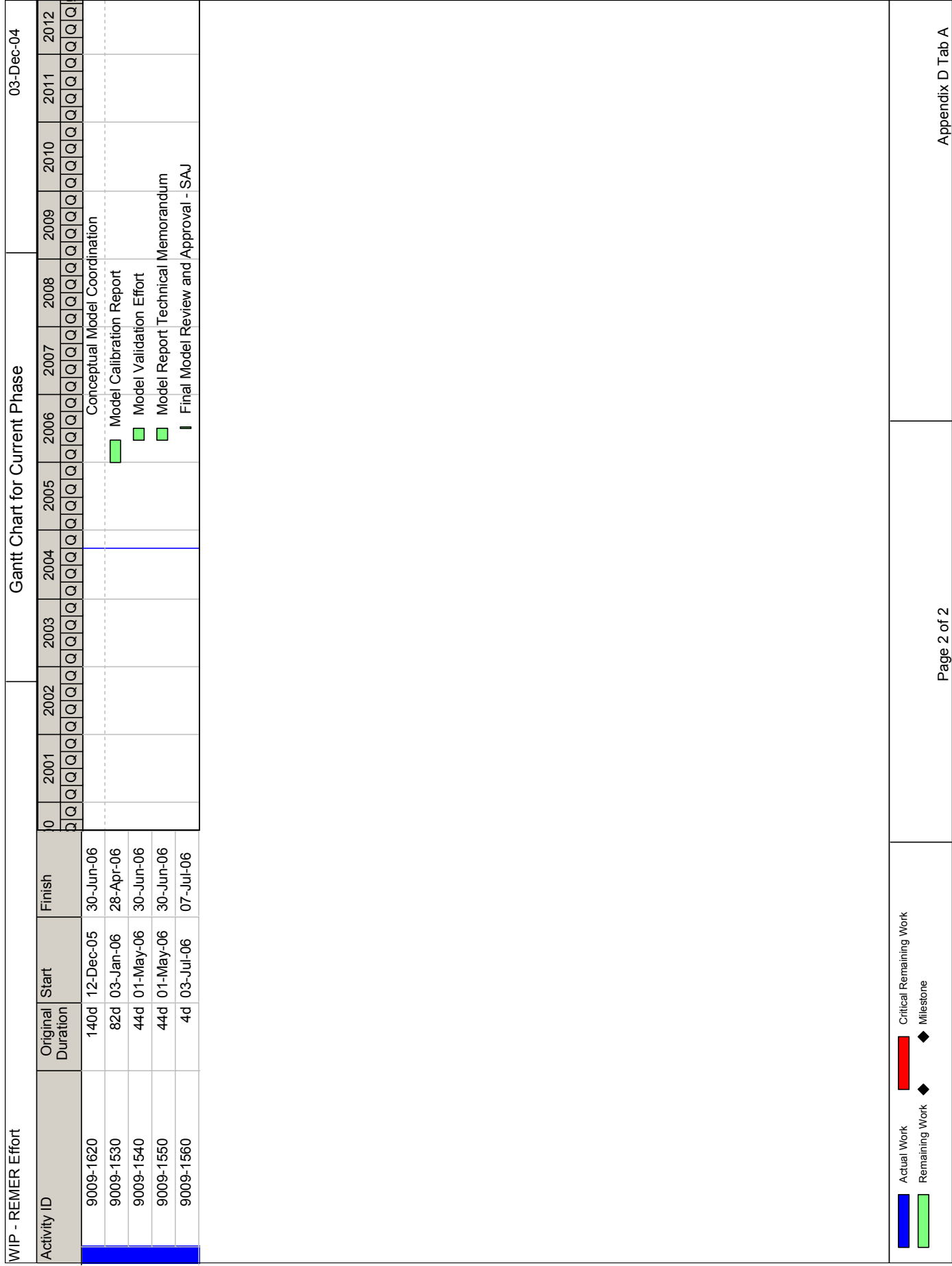
Appendix C Tab A - Activity Listing by WBS							03-Dec-04
Activity ID	Activity Name	Remaining Duration	Resource IDs	Start	Finish	Budgeted Total Cost	
115285 - WIP-1 WIP - REMER Effort							
115285 - WIP-1.25000 Project Management Plan							
9009-1290	Initiate PMP	442d		01-Oct-04 A	07-Jul-06	\$ 4,550,647.00	
9009-1300	Initial PMP Review	442d		01-Oct-04 A	07-Jul-06	\$ 4,434,977.00	
9009-1310	Senior Management Review of PMP	13d	U430510-CHL-HYDROLOG	01-Oct-04 A	20-Oct-04	\$ 30,000.00	
9009-1330	Prepare Final Draft PMP	21d	U430510-CHL-HYDROLOG	21-Oct-04	19-Nov-04	\$ 20,000.00	
9009-1320	Present PMP to DCT	10d		22-Nov-04	06-Dec-04	\$ 0.00	
9009-1340	Final Approval of PMP by DDE	17d	U430510-CHL-HYDROLOG	22-Nov-04	15-Dec-04	\$ 10,000.00	
		4d		07-Dec-04	10-Dec-04	\$ 0.00	
		5d		16-Dec-04	22-Dec-04	\$ 0.00	
115285 - WIP-1.25000.25900 Model Development							
115285 - WIP-1.25000.25900.1 Project Management							
9009-1350	Travel EN (EN-HI)	442d		01-Oct-04 A	07-Jul-06	\$ 1,196,000.00	
9009-1360	REMER Liaison - Management & Oversight	442d	TRAVEL	01-Oct-04 A	07-Jul-06	\$ 24,000.00	
9009-1370	Establish Modeling Objectives	442d	U430510-CHL-HYDROLOG, EN-HI	01-Oct-04 A	07-Jul-06	\$ 754,000.00	
9009-1570	ERDC Project Contingency	62d	U430510-CHL-HYDROLOG	01-Oct-04 A	03-Jan-05	\$ 20,000.00	
9009-1580	Travel ERDC (office & liason)	442d	U430510-CHL-HYDROLOG	01-Oct-04 A	07-Jul-06	\$ 310,000.00	
		442d	TRAVEL	01-Oct-04 A	07-Jul-06	\$ 88,000.00	
115285 - WIP-1.25000.25900.3 Data Management and Evaluation							
9009-1380	Data Collection and Evaluation Phase 1	332d		01-Oct-04	31-Jan-06	\$ 1,063,000.00	
9009-1610	Structure Datum Conversion	61d	U430510-CHL-HYDROLOG	01-Oct-04	30-Dec-04	\$ 80,000.00	
9009-1600	Operational Rules and Regulation Schedules	123d	EN-DT	01-Oct-04	31-Mar-05	\$ 538,000.00	
9009-1390	Data Collection and Evaluation Phase 2	145d	EN-HW	01-Nov-04	31-May-05	\$ 85,000.00	
9009-1400	Data Collection and Evaluation Phase 3 Draft Rep...	62d	U430510-CHL-HYDROLOG	03-Jan-05	31-Mar-05	\$ 80,000.00	
9009-1410	Data Collection and Evaluation Phase 4 - Final Sp...	64d	U430510-CHL-HYDROLOG	01-Apr-05	30-Jun-05	\$ 140,000.00	
9009-1420	Data Collection and Evaluation Phase 5 - Final Ti...	125d	U430510-CHL-HYDROLOG	01-Jul-05	30-Dec-05	\$ 80,000.00	
		145d	U430510-CHL-HYDROLOG	01-Jul-05	31-Jan-06	\$ 60,000.00	
115285 - WIP-1.25000.25900.4 Conceptual Model							
9009-1430	Geologic Data Info Report 1	431d		13-Oct-04	30-Jun-06	\$ 575,180.00	
9009-1440	Hydrologic Processes Draft Report	79d	U430510-CHL-HYDROLOG, EN-GS, EN-GG	13-Oct-04	07-Feb-05	\$ 173,265.00	
9009-1450	Initial Geologic Conceptual Model	102d	U430510-CHL-HYDROLOG	13-Oct-04	11-Mar-05	\$ 60,000.00	
9009-1460	Final Geologic Conceptual Model	87d	U430510-CHL-HYDROLOG, EN-GG, EN-GS	08-Feb-05	10-Jun-05	\$ 157,395.00	
9009-1620	Conceptual Model Coordination	125d	U430510-CHL-HYDROLOG, EN-GG, EN-GS	13-Jun-05	09-Dec-05	\$ 173,480.00	
		140d	EN-GG, EN-GS	12-Dec-05	30-Jun-06	\$ 11,040.00	
115285 - WIP-1.25000.25900.5 Structures and Rating Curves							
9009-1480	Operations Rules and Rating Curves	292d		01-Nov-04	30-Dec-05	\$ 240,800.00	
9009-1470	ORI Progress Report & Data Status Checkpoint	292d	U430510-CHL-HYDROLOG	01-Nov-04	30-Dec-05	\$ 240,800.00	
		20d		03-Jan-05	31-Jan-05	\$ 0.00	
115285 - WIP-1.25000.25900.6 Model Development and Code ...							
9009-1490	Initial Mesh Development	387d		13-Oct-04	28-Apr-06	\$ 903,330.00	
		123d	U430510-CHL-HYDROLOG	13-Oct-04	11-Apr-05	\$ 300,000.00	
WIP - REMER Effort			Appendix C Tab A				
Data Date: 01-Oct-04			Page 1 of 2				

Appendix C Tab A - Activity Listing by WBS							03-Dec-04
Activity ID	Activity Name	Remaining Duration	Resource IDs	Start	Finish	Budgeted Total Cost	
115285 - WIP-1.25000.25900.7 Model Approval	9009-1500 Initial Numeric Model	43d	U430510-CHL-HYDROLOG	12-Apr-05	10-Jun-05	\$ 100,000.00	
	9009-1510 Preliminary Model Sensitivity Analysis	84d	U430510-CHL-HYDROLOG	13-Jun-05	11-Oct-05	\$ 233,330.00	
	9009-1520 Model Documented for Calibration Effort	41d	U430510-CHL-HYDROLOG	01-Nov-05	30-Dec-05	\$ 106,667.00	
	9009-1530 Model Calibration Report	82d	U430510-CHL-HYDROLOG	03-Jan-06	28-Apr-06	\$ 163,333.00	
	9009-1590 CESAJ - Interagency Modeling Center ITR & Mode...	386d	EN-HI	23-Dec-04	07-Jul-06	\$ 240,000.00	
	9009-1540 Model Validation Effort	44d	U430510-CHL-HYDROLOG	01-May-06	30-Jun-06	\$ 103,333.00	
	9009-1550 Model Report Technical Memorandum	44d	U430510-CHL-HYDROLOG	01-May-06	30-Jun-06	\$ 48,334.00	
	9009-1560 Final Model Review and Approval - SAJ	4d	U430510-CHL-HYDROLOG	03-Jul-06	07-Jul-06	\$ 5,000.00	
	9009-1280 Topographic survey data QA/QC for REMER	251d	EN-DT	01-Oct-04	30-Sep-05	\$ 28,000.00	
	9009-1250 EN-G Travel for REMER	438d	TRAVEL	01-Oct-04	30-Jun-06	\$ 7,500.00	
	9009-1260 EN-G Management Support for REMER	438d	EN-G	01-Oct-04	30-Jun-06	\$ 16,170.00	
	9009-1270 CESAJ GIS Support for REMER IM-I	442d	IM-I	01-Oct-04	07-Jul-06	\$ 64,000.00	
115285 - WIP-1.2 Pre-existing REMER FY05 Activ...							
WIP - REMER Effort							
Data Date: 01-Oct-04							
Page 2 of 2							
Appendix C Tab A							

## **APPENDIX D: PROJECT SCHEDULE**

### **TAB A–Gantt Chart for Current Phase**





## **APPENDIX E: PROJECT COST ESTIMATE AND BUDGET**

TAB A–Total Project Cost Summary

Appendix E Tab A - Total Project  
Cost Summary

03-Dec-04 10:54

Activity ID	Activity Name	Budgeted Total Cost	Start	Finish
<b>115285 - WIP-1 WIP - REMER Effort</b>		<b>\$ 4,550,647.00</b>	<b>01-Oct-04 A</b>	<b>07-Jul-06</b>
<b>115285 - WIP-1.25000 Project Management Plan</b>		<b>\$ 4,434,977.00</b>	<b>01-Oct-04 A</b>	<b>07-Jul-06</b>
<b>115285 - WIP-1.25000.25900 Model Development</b>		<b>\$ 4,374,977.00</b>	<b>01-Oct-04 A</b>	<b>07-Jul-06</b>
<b>115285 - WIP-1.25000.25900.1 Project Management</b>		<b>\$ 1,196,000.00</b>	<b>01-Oct-04 A</b>	<b>07-Jul-06</b>
<b>115285 - WIP-1.25000.25900.3 Data Management and Evaluation</b>		<b>\$ 1,063,000.00</b>	<b>01-Oct-04</b>	<b>31-Jan-06</b>
<b>115285 - WIP-1.25000.25900.4 Conceptual Model</b>		<b>\$ 575,180.00</b>	<b>13-Oct-04</b>	<b>30-Jun-06</b>
<b>115285 - WIP-1.25000.25900.5 Structures and Rating Curves</b>		<b>\$ 240,800.00</b>	<b>01-Nov-04</b>	<b>30-Dec-05</b>
<b>115285 - WIP-1.25000.25900.6 Model Development and Code Enhanc...</b>		<b>\$ 903,330.00</b>	<b>13-Oct-04</b>	<b>28-Apr-06</b>
<b>115285 - WIP-1.25000.25900.7 Model Approval</b>		<b>\$ 396,667.00</b>	<b>23-Dec-04</b>	<b>07-Jul-06</b>
<b>115285 - WIP-1.2 Pre-existing REMER FY05 Activities</b>		<b>\$ 115,670.00</b>	<b>01-Oct-04</b>	<b>07-Jul-06</b>

## **APPENDIX F: RESOURCE AND ROLE ASSIGNMENTS**

### **TAB A–Resource and Role Assignments**



App F Tab A - Resource and Role Assignments

WBS 115285 - WIP - REMER Effort  
WIP-1

Office	Activity ID	Activity Name	Total Float	Start	Finish	Budgeted Cost
EN-DT	9009-1280	Topographic survey data QA/QC for REMER	197d	01-Oct-04	30-Sep-05	\$ 28,000.00
	9009-1610	Structure Datum Conversion	325d	01-Oct-04	31-Mar-05	\$ 538,000.00
	Resource Sub Total					\$ 566,000.00
EN-G	9009-1260	EN-G Management Support for REMER	6d	01-Oct-04	30-Jun-06	\$ 16,170.00
	Resource Sub Total					\$ 16,170.00
EN-GG	9009-1430	Geologic Data Info Report 1	20d	13-Oct-04	07-Feb-05	\$ 120,265.00
	9009-1450	Initial Geologic Conceptual Model	20d	08-Feb-05	10-Jun-05	\$ 36,395.00
	9009-1460	Final Geologic Conceptual Model	20d	13-Jun-05	09-Dec-05	\$ 35,280.00
	9009-1620	Conceptual Model Coordination	6d	12-Dec-05	30-Jun-06	\$ 5,040.00
	Resource Sub Total					\$ 196,980.00
EN-GS	9009-1430	Geologic Data Info Report 1	20d	13-Oct-04	07-Feb-05	\$ 7,000.00
	9009-1450	Initial Geologic Conceptual Model	20d	08-Feb-05	10-Jun-05	\$ 12,000.00
	9009-1460	Final Geologic Conceptual Model	20d	13-Jun-05	09-Dec-05	\$ 9,000.00
	9009-1620	Conceptual Model Coordination	6d	12-Dec-05	30-Jun-06	\$ 6,000.00
	Resource Sub Total					\$ 34,000.00
EN-HI	9009-1360	REMER Liaison - Management & Oversight	6d	01-Oct-04	07-Jul-06	\$ 454,000.00

## App F Tab A - Resource and Role Assignments

WBS 115285 - WIP - REMER Effort  
WIP-1

Office	Activity ID	Activity Name	Total Float	Start	Finish	Budgeted Cost
EN-HI	9009-1590	CESAJ - Interagency Modeling Center ITR & Model Evaluation Group	6d	23-Dec-04	07-Jul-06	\$ 240,000.00
					<b>Resource Sub Total</b>	<b>\$ 694,000.00</b>
<b>EN-HW</b>						
EN-HW	9009-1600	Operational Rules and Regulation Schedules	283d	01-Nov-04	31-May-05	\$ 85,000.00
					<b>Resource Sub Total</b>	<b>\$ 85,000.00</b>
<b>IM-I</b>						
IM-I	9009-1270	CESAJ GIS Support for REMER IM-I	6d	01-Oct-04	07-Jul-06	\$ 64,000.00
					<b>Resource Sub Total</b>	<b>\$ 64,000.00</b>
<b>TRAVEL</b>						
TRAVEL	9009-1250	EN-G Travel for REMER	6d	01-Oct-04	30-Jun-06	\$ 7,500.00
	9009-1350	Travel EN (EN-HI)	6d	01-Oct-04 A	07-Jul-06	\$ 24,000.00
TRAVEL	9009-1580	Travel ERDC (office & liason)	6d	01-Oct-04 A	07-Jul-06	\$ 88,000.00
					<b>Resource Sub Total</b>	<b>\$ 119,500.00</b>
<b>U430510-CHL-HYDROLOG</b>						
U430510-CHL-HYDROLOG	9009-1570	ERDC Project Contingency	6d	01-Oct-04 A	07-Jul-06	\$ 310,000.00
	9009-1290	Initiate PMP	6d	01-Oct-04 A	20-Oct-04	\$ 30,000.00
U430510-CHL-HYDROLOG	9009-1330	Prepare Final Draft PMP	388d	22-Nov-04	15-Dec-04	\$ 10,000.00
	9009-1360	REMER Liaison - Management & Oversight	6d	01-Oct-04 A	07-Jul-06	\$ 300,000.00
U430510-CHL-HYDROLOG	9009-1370	Establish Modeling Objectives	386d	01-Oct-04 A	03-Jan-05	\$ 20,000.00
	9009-1380	Data Collection and Evaluation Phase 1	6d	01-Oct-04	30-Dec-04	\$ 80,000.00

## App F Tab A - Resource and Role Assignments

WBS 115285 - WIP - REMER Effort  
WIP-1

Office	Activity ID	Activity Name	Total Float	Start	Finish	Budgeted Cost
U430510-CHL-HYDROLOG	9009-1390	Data Collection and Evaluation Phase 2	6d	03-Jan-05	31-Mar-05	\$ 80,000.00
U430510-CHL-HYDROLOG	9009-1400	Data Collection and Evaluation Phase 3 Draft Reports for Spatial and Time Series Data	6d	01-Apr-05	30-Jun-05	\$ 140,000.00
U430510-CHL-HYDROLOG	9009-1410	Data Collection and Evaluation Phase 4 - Final Spatial Data Report	6d	01-Jul-05	30-Dec-05	\$ 80,000.00
U430510-CHL-HYDROLOG	9009-1420	Data Collection and Evaluation Phase 5 - Final Time Series Data Report	68d	01-Jul-05	31-Jan-06	\$ 60,000.00
U430510-CHL-HYDROLOG	9009-1430	Geologic Data Info Report 1	20d	13-Oct-04	07-Feb-05	\$ 46,000.00
U430510-CHL-HYDROLOG	9009-1450	Initial Geologic Conceptual Model	20d	08-Feb-05	10-Jun-05	\$ 109,000.00
U430510-CHL-HYDROLOG	9009-1460	Final Geologic Conceptual Model	20d	13-Jun-05	09-Dec-05	\$ 129,200.00
U430510-CHL-HYDROLOG	9009-1480	Operations Rules and Rating Curves	6d	01-Nov-04	30-Dec-05	\$ 240,800.00
U430510-CHL-HYDROLOG	9009-1490	Initial Mesh Development	20d	13-Oct-04	11-Apr-05	\$ 300,000.00
U430510-CHL-HYDROLOG	9009-1500	Initial Numeric Model	20d	12-Apr-05	10-Jun-05	\$ 100,000.00
U430510-CHL-HYDROLOG	9009-1510	Preliminary Model Sensitivity Analysis	20d	13-Jun-05	11-Oct-05	\$ 233,330.00
U430510-CHL-HYDROLOG	9009-1520	Model Documented for Calibration Effort	6d	01-Nov-05	30-Dec-05	\$ 106,667.00
U430510-CHL-HYDROLOG	9009-1530	Model Calibration Report	6d	03-Jan-06	28-Apr-06	\$ 163,333.00
U430510-CHL-HYDROLOG	9009-1540	Model Validation Effort	6d	01-May-06	30-Jun-06	\$ 103,333.00
U430510-CHL-HYDROLOG	9009-1550	Model Report Technical Memorandum	6d	01-May-06	30-Jun-06	\$ 48,334.00
U430510-CHL-HYDROLOG	9009-1440	Hydrologic Processes Draft Report	84d	13-Oct-04	11-Mar-05	\$ 60,000.00
U430510-CHL-HYDROLOG	9009-1300	Initial PMP Review	388d	21-Oct-04	19-Nov-04	\$ 20,000.00
U430510-CHL-HYDROLOG	9009-1560	Final Model Review and Approval - SAJ	6d	03-Jul-06	07-Jul-06	\$ 5,000.00
<b>Resource Sub Total</b>						<b>\$ 2,774,997.00</b>

Project Start: 01-Oct-04  
A

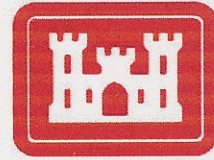
Project Start: 07-Jul-06

Appendix F Tab A

App F Tab A - Resource and Role Assignments

WBS 115285 - WIP - REMER Effort									
WIP-1									
Office	Activity ID	Activity Name	Total Float	Start	Finish	Budgeted Cost		Project Total: \$ 4,550,647.00	





## MEMORANDUM OF UNDERSTANDING

### IT/IM SUPPORT

### FOR THE CERPZone NETWORK

Section 2.2.1.1 of the CERP Master Program Management Plan, August 2000, specified:

"A separate network will be established to facilitate electronic document storage and retrieval as well as information management and collaboration for the Comprehensive Plan implementation. This shared data and information network will be equally accessible to both the SFWMD and the Corps. It will consist of a web site and servers that will allow for sharing of draft and final documents, schedules, financial, scientific and geospatial data, and other program-related information between the Corps, SFWMD and other authorized users. The infrastructure and software will be designed to eliminate the potential for security and firewall breaches that could threaten the integrity of the system and the information it contains. The web site also will be used to post information and data for review by other agencies, stakeholder groups and the public."

Accordingly, in spring 2001, CERP Program Controls directed the CIOs of the SFWMD and USACE, Jacksonville District, to implement this language. The result, which became available to users in August 2001, its staff and governance structures are collectively known as the CERPZone.

The purpose of this MOU is to describe and document the facilities, equipment and support services required to operate and maintain this network.

The IM/IT equipment, services and institutional expertise are co-located, inextricably linked, and inseparable from the CERPZone partnering agencies in their IM/IT functions. The CERP IT resources are managed under the established IM/IT Program Governances. Any change requires the consent of the appropriate joint SFWMD and USACE IM/IT appointees or their delegate via one of the following processes.



1. CERPZone Information Technology Initiation Form (CITIF)  
Purpose: To identify new business requirements, recommend IT solutions, and approve and allocate resources to procure network technology equipment or services to support the needs of CERP.  
Required approvals: (one from each agency at each level)
  - a. Approved Requestors from CERP User Community
  - b. Funding Approver
  - c. IT Reviewer
  - d. CIOFrequency: As needed
2. CERPZone Change Control  
Purpose: To process and review proposed changes that will affect IT/IM resources located in the CERPZone network.  
Required approvals: (one from each agency)
  - a. Co-chairs of Technology Management BoardFrequency: Weekly or as needed
3. CIO Meeting –  
Purpose: To align and prioritize CERP information management efforts with programmatic requirements and to participate in cross-organizational IT planning efforts to provide clear direction to the CERP IM/IT program.  
Required approvals: Chief Information Officer (one from each agency)  
Frequency: As needed

The network equipment is being housed in the facilities of both the SFWMD EOC and CESAJ NCC. The location and access to this equipment has been negotiated by the sponsoring agencies and cannot be changed without the approval of both agency CIOs. Each agency will provide appropriate building infrastructure (space, utilities) for the equipment within their facilities.

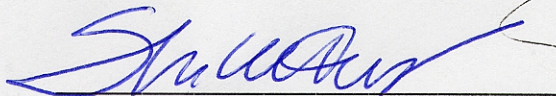
The employees of SFWMD and USACE and contractors of these agencies are being housed in office facilities provided by the sponsoring agencies. The location of the contracted personnel has been negotiated by the sponsoring agencies and cannot be changed without the approval of both agency CIOs. Each agency will furnish and provide appropriate office space, office supplies, computer equipment and time, telephone, and reproduction facilities, as required for this project for the respective employees housed within their facility. Personnel will be required to comply with the appropriate security requirements of their host facility.

The employees of SFWMD and USACE and contractors of these agencies will provide support for existing and future CERP automation, communications,



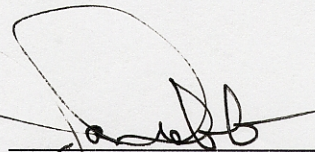
information assurance, web sites, application development, database support, server support, records management, end-user support, geographic information systems, and the IM/IT facilities.

All current and future IM/IT endeavors must preserve the 50/50 partnership mandated by Congress. This support must preserve the current and future IM/IT CERP Organization and Structure. All contracted personnel will work within the framework of the existing agreements and is not empowered to negotiate with the CERP State or Federal Agency partners.



SHARON TROST  
Chief Information Officer  
South Florida Water Management  
District

3/30/05  
Date



JAMES M. COBB  
Chief Information Officer  
US Army Corps of Engineers

29 MAR 05  
Date



## Interagency Modeling Center Concept Agreement

### 29 April 2003

**Vision:** The Comprehensive Everglades Restoration Program (CERP) requires an unprecedented volume of numerical simulation modeling to estimate the performance of proposed projects. In order to increase the synergy among the Jacksonville District of the U. S. Army Corps of Engineers (Corps), the South Florida Water Management District (SFWMD), and other agencies and stakeholders, the Corps and the SFWMD are creating an Interagency Modeling Center (IMC). The IMC will be the umbrella organization for organizing, integrating, and supplementing available modeling resources as necessary to accomplish CERP requirements. The Corps and the SFWMD have worked closely to develop a shared vision of an IMC, formed and staffed the IMC by Corps and SFWMD employees and their contractors, and included participants from other agencies. The purpose of this document is to provide direction for the implementation of the IMC.

**Concepts:** The IMC is in the later stages of concept development. Detailed implementation planning is underway as is actual implementation. The IMC's primary function is to fulfill the modeling requirements of CERP. Additionally, other southern Florida modeling requirements of joint interest to the Corps and the SFWMD may be performed by the IMC when necessary and as capacity allows. The IMC is under the joint technical direction of the Corps' Chief of the Hydrology and Hydraulics Branch and the SFWMD's Director of the Hydrologic Systems Modeling Division. Accordingly, they are responsible for the technical integrity of products from the IMC. The IMC will be physically located in the vicinity of West Palm Beach, Florida. The IMC is expected to be in operation as long as the CERP modeling demands require. Implementation of the IMC and certain model development will be a CERP programmatic cost while production work will be charged to specific projects or programs

**IMC Responsibility Umbrella:** The IMC is responsible for meeting all modeling needs of CERP and coordinating, reviewing, and approving any CERP modeling performed outside of the IMC by others including contractors. This includes support for the RECOVER program (REstoration COordination and VERification) and support for CERP and non-CERP water management control system operations. The IMC will provide or will coordinate and review other modeling contract efforts to support individual CERP projects. CERP modeling covers a range of model spatial scales and types.

#### Types of Modeling

- Hydrologic
- Hydraulic
- Hydrodynamic
- Water Quality
- Ecological

#### Model Spatial Scales

- Regional
- Sub-Regional
- Project Specific

**Phased Implementation:** The IMC is being implemented in three stages. The three stages are integrated to form an overall implementation approach and applies interim, near-term, and long-term strategies simultaneously. The three stages are defined as:

- **Stage One:** Implement improved methods of delivering modeling services to PDTs and RECOVER during interim period of 2003 or until Stage 1 IMC is fully operational. Includes establishing process for joint prioritization of regional runs; creating process for assisting PDTs



and RECOVER in model selection, and for reviewing scopes and results for contracted modeling services for subregional efforts.

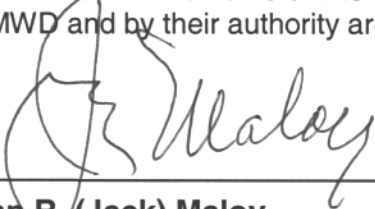
- **Stage Two:** Second stage of IMC implementation focuses on building capacity to providing all CERP required regional modeling services, including ecological and water quality modeling for projects and RECOVER. During this phase, the IMC will become fully capable for regional hydrologic simulation modeling and will expand capabilities to support and manage, as needed, other required CERP modeling on the subregional scale.
- **Stage Three:** Fully implemented IMC with capacity to provide (managing, coordinating, and providing oversight and approval as necessary, using contractors as necessary) all CERP required modeling services (RECOVER, regional, sub-regional, site specific, water quality, ecological, etc.).

During these three stages of development, the Corps, the SFWMD, will manage regional hydrologic modeling responsibilities for CERP as depicted in Figure 1. The Corps and the SFWMD will share the responsibilities of primary model development for the SFWMM (2x2) and the SFRSM and the training of their staff and modelers assigned to the IMC. Training will also be provided to staff of other agencies that make a commitment to participate in IMC. The IMC will be responsible for further regional hydrologic model development only as it relates to specific applications of the models for CERP. Additionally, the IMC will be responsible for specific CERP production modeling applications. As part of these model implementation and applications and production responsibilities, the IMC will manage the PDT and RECOVER interface with modeling liaisons. Ideally, modeling liaisons will be permanent employees of either the Corps or the SFWMD.

**Initial IMC Management:** The IMC will initially be managed on a day to day basis by Jayantha Obeysekera, SFWMD, and Russell Weeks, Corps, with management oversight and direction from their respective supervisors, John Mulliken and John Hashtak. The group, supported by contractors and other staff, will meet routinely with Jack Maloy and Dennis Duke to review progress and production, resolve issues, and plan for future improvements in the IMC implementation process. The group will also have responsibility to complete a CERP Guidance Memorandum (CGM) and a Project Management Plan (PMP) for the IMC.

**Implementation Strategy:** As the IMC is further developed and implemented, the concepts outlined here will be detailed and further documented and eventually this document will be superceded. At present, this document is to establish understanding of common vision and serve as a guide to the initial phase of IMC implementation.

**Approvals:** The contents of this document are agreed by the CERP leadership of the CORPS and SFWMD and by their authority are to be implemented and communicated immediately.



**John R. (Jack) Maloy**  
Chief Executive Consultant, Water Resources  
South Florida Water Management District

DATE: \_\_\_\_\_

4/29/03

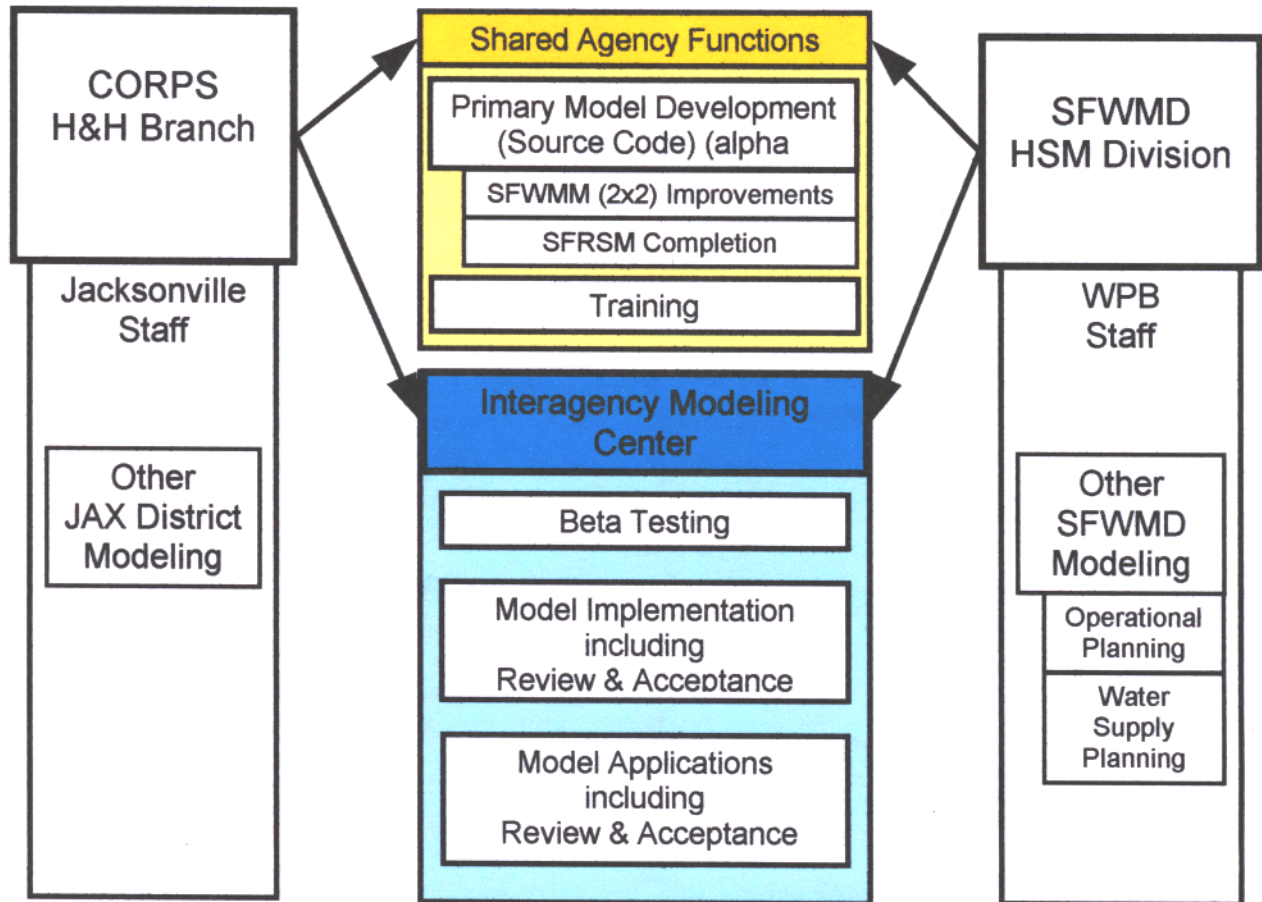


**Dennis R. Duke**  
CERP Program Manager  
US Army Corps of Engineers

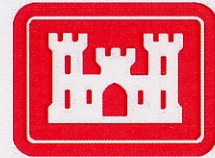
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4/29/03

**Figure 1. Regional Hydrologic Modeling Responsibilities**







## MEMORANDUM OF UNDERSTANDING

### Interagency Modeling Center (IMC)

#### NETWORK STRUCTURE

The purpose of the Interagency Modeling Center (IMC) is to provide modeling support for the implementation of the Comprehensive Everglades Restoration Plan (CERP). The following documents provide guidelines for the establishment and operation of the IMC: IMC Program Management Plan dated January 2004, CERP Guidance Memorandum No. 030.00 dated July 22, 2003, and the IMC Concept Agreement dated April 29, 2003.

The SFWMD and USACE have provided for a 50/50 partnership to support the IMC and CERPZone networks. The purpose of this MOU is to describe and document the Network Structure and the support services required by all of the networks that are within the IMC, and to further describe paragraph 3.4.4, the Technical Support section of the IMC PMP.

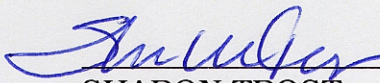
The IMC utilizes four networks to support modelers. The function of each network is explained below:

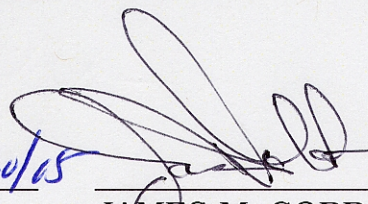
1. The IMC Network. Consisting of, but not limited to, Sun workstations, and Sun servers in support of the running the SFWMM Model (2x2). The next phase includes the Windows and Linux platforms to support several regional, sub regional and project-level models. The IMC Network is housed in the SFWMD EOC Facility located in West Palm Beach, Florida.
2. The Jacksonville Network. Consists of, but not limited to, PC's in support of USACE employees, as well as access to CERPZone, the Internet, USACE Intranet, USACE e-mail and CEFMS. The Jacksonville Network is housed in the USACE Jacksonville District Facility in Jacksonville, Florida.
3. The SFWMD Network. Consisting of, but not limited to, PC's, operating in either the Linux or Windows environments, in support of modelers SFWMD e-mail and calendaring capabilities, access to SFWMD intranet, the Internet, as well as sharing files. The



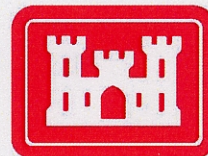
SFWMD Network is housed in the SFWMD EOC Facility located in West Palm Beach, Florida.

4. The CERPZone Network. Consisting of, but not limited to applications such as Evergladesplan.org website, CERPZone.org website, Documentum, P3e, Resource Tracking System (RTS), and publishing modeling results to the internal CERPZone network for internal review, and publishing to the external CERPZone network for public viewing through a web based application (PM Viewer). In the future, the function of publishing ("posting") of modeling data will be housed in the IMC. The CERPZone Network is housed in the USACE Jacksonville District Facility in Jacksonville, Florida and in the SFWMD EOC Facility located in West Palm Beach, Florida.
  - a. Publishing modeling results for internal and external viewing is accomplished through a web based application (PM Viewer) in the CERPZone, which requires accessing modeling/staging servers on the SFWMD Network and a Spatial Data Base housing GIS data on the SFWMD Network using several different ARCGIS tools. The Data Loader is using SQL Loader on the SFWMD Network creating an ODBC connection to the Oracle Data Base in the CERPZone Network loading data from the modeling/staging server on the SFWMD Network.

 Date: 3/30/05  
SHARON TROST  
Chief Information Officer  
South Florida Water Management  
District

 Date: 3/30/05  
JAMES M. COBB  
Chief Information Officer  
US Army Corps of Engineers





## MEMORANDUM OF UNDERSTANDING

### Interagency Modeling Center (IMC)

#### Information Technology Support and Services, and Building Facilities

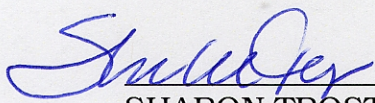
The purpose of the Interagency Modeling Center (IMC) is to provide modeling support for the implementation of the Comprehensive Everglades Restoration Plan (CERP). The following documents provide guidelines for the establishment and operation of the IMC: IMC Program Management Plan dated January 2004, CERP Guidance Memorandum No. 030.00 dated July 22, 2003, and the IMC Concept Agreement dated April 29, 2003.

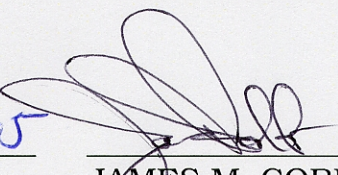
The purpose of this MOU is to document the responsibilities of each of the partners for the sharing of IT Support and Services and Building Facilities furnished at the West Palm Beach location and to further describe paragraph 3.4.4, the Technical Support section of the IMC PMP. On 13 January 2003, the IMC was built within the headquarters facilities of the South Florida Water Management District (SFWMD) in West Palm Beach providing space for IMC employees to include USACE employees and their contractors. IMC employees are also located in the USACE Jacksonville District facility in Jacksonville, Florida. The USACE also furnishes IT support and services as well as building facilities for IMC employees located in Jacksonville, Florida. The SFWMD and USACE have provided for the 50/50 partnership support and services described below as well as share their use:

	<u>Furnish and Support IT Services</u>	
	<u>SFWMD</u>	<u>USACE</u>
Building Facilities, Office Work Space, Furniture and Electrical Power	x	x
Computer Room Facilities including EOC and Electrical Power	x	
Telephone Systems and Voicemail Services	x	x
Email and Calendaring	x	x



	<u>Furnish and Support IT Services</u>	
	<u>SFWMD</u>	<u>USACE</u>
Fax/Copier/Printer Unit	x	x
VTC Equipment	x	x
Printers	x	x
IMC Network Hardware, Desktops Software, Data Storage and Backup	x	x
Professional Modeling Services and Support of each agencies Employees and Consultants sharing their Expertise	x	x
Applications and Scripts	x	x
SFWM Model (2x2 Application)	x	x
Modeling Data Collection	x	
Modeling Data Support	x	x


 Date: 3/30/05  
 SHARON TROST  
 Chief Information Officer  
 South Florida Water Management  
 District


 Date: 3/30/05  
 JAMES M. COBB  
 Chief Information Officer  
 US Army Corps of Engineers



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# CERP Guidance Memorandum

*South Florida Water Management District – Jacksonville District, U.S. Army Corps Of Engineers*

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**CGM NUMBER-REVISION:** 030.00

**EFFECTIVE DATE:** 07/22/03

**CATEGORY:** Modeling

**SUBJECT:** Interagency Modeling Center (IMC)

## **DESCRIPTION:**

This memorandum provides guidance to Project Delivery Teams (PDTs) and RECOVER for obtaining modeling support for implementation of CERP projects during Stage One of the IMC implementation and until the IMC Program Management Plan (PMP) is drafted and approved. (For explanation of Stage One of IMC implementation, see Exhibit A: Interagency Modeling Center Concept Agreement, 29 April 2003.) The leadership of the IMC, CERP Project Management, and RECOVER has reached an agreement on coordination of modeling services (see Exhibit B). This CGM reflects the details of that agreement. It is anticipated that this CGM will be updated after the PMP is approved.

In view of the large number of concurrent CERP projects requiring planning and design, it is expected that the modeling support for CERP over the next several decades will be extensive. These modeling requirements exceed the combined capacity of the South Florida Water Management District (SFWMD) and the Jacksonville District of the U. S. Army Corps of Engineers (Corps).

The IMC has been conceptualized with the primary goal of providing timely support for PDTs and RECOVER. The IMC will provide guidance to PDTs and RECOVER on the basis of thorough technical analyses with best available data and modeling tools. Every effort will be made to resolve real or apparent conflicts associated with CERP modeling tasks in a timely manner.

The IMC will be jointly managed by the Hydrologic Systems Modeling (HSM) Division of SFWMD and the Hydrology & Hydraulics (H&H) Branch of the Corps. Other agencies will participate in the IMC as specified in agreements with the Corps and SFWMD.

The modeling needed for PDTs and RECOVER has been categorized into three scales:

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1. Regional (system-wide, essentially the model domain of the SFWMM, aka 2x2),
2. Sub-regional (covering CERP sub-regions, multiple CERP projects, or individual counties), and
3. Project Specific (to address project-specific questions and issues)

It also covers modeling with respect to the following disciplines:

- hydrology
- hydraulics
- hydrodynamics
- water quality
- ecology
- flood protection

The IMC is to be notified of all CERP modeling requests including those requested to be performed by the IMC and those to be performed by others. In this way, consistency among modeling efforts can be coordinated. All modeling will be performed with the most appropriate tools available as approved by the IMC.

In order to assure that technical modeling products and services meet the standards of each agency's responsible parties for technical modeling products and services, all contracted procurement of technical modeling products and services must be reviewed, procured, managed, approved, and accepted by and under the direction of the IMC, the HSM Division of SFWMD, or the H&H Branch of the Corps.

During Stage One, the IMC will focus on building and providing the capacity required to meet the regional modeling demands of PDTs and RECOVER. Additionally, the IMC will establish a process for prioritizing regional hydrologic simulations while capacity is growing to meet demand. Finally, for CERP modeling needs not fulfilled directly by the IMC, statements of work, contracted modeling services, model selection, input information, and completed modeling products for work performed outside the IMC including work performed by contractors will be reviewed and approved by the IMC, the HSM Division of SFWMD, or the H&H Branch of the Corps.

During Stage One, the IMC is occupying interim office space at the SFWMD headquarters. The IMC will be supported by staff from both SFWMD and the Corps and their contractors. Other participating agencies currently identified include certain of those from the Department of Interior (DOI). Additional agencies may participate in the

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future. The IMC will serve as a central point to coordinate CERP and CERP-related modeling activities, and provide the mechanism to increase the joint capacity to deliver modeling services. Other aspects of implementing the IMC, including organizational, governance, technical, and site/space requirements are in the process of being developed.

The IMC will accept CERP modeling requests directly from its customers defined here:

- Project Delivery Teams
- RECOVER

Other modeling requests must be made through the senior management of the SFWMD or Corps.

IMC modeling tasks will be executed jointly by responsibly appropriate technical staff of the SFWMD and Corps who will manage and supervise agency staff and contractors as necessary to complete the tasks. The SFWMD and the Corps have each appointed one staff member as their IMC team leader who will jointly schedule and direct the day to day efforts including technical coordination with IMC customers and technical work performed by the IMC. The IMC team leader for the SFWMD will report to the director of the Hydrologic Systems Modeling Division. The IMC team leader for the Corps will report to Chief, Hydrologic Investigations in Hydraulics and Hydrology Branch of the Jacksonville office of the Corps.

During Stage One, the IMC will:

- Ensure consistency across model scales and disciplines and provide boundary conditions from regional models
- Approve model selection for hydrologic, hydraulic, hydrodynamic, water quality, ecological, and flood protection modeling for sub-regional and project specific applications performed outside the IMC including by contractors.

The IMC team leaders are the primary points of contact for all PDTs and RECOVER. They will coordinate the scheduling of all regional-scale modeling efforts directly with project managers as described below. Scheduling conflicts will be resolved by IMC team leaders in consultation with their supervisors. Technical conflicts will be resolved by the Chief of the Hydrology & Hydraulics Branch of the Corps and the Director of the Hydrologic Systems Modeling Division of the SFWMD.

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The IMC will also include CERP Modeling Liaisons for PDTs and RECOVER. Their primary responsibility is to represent the IMC at PDT and RECOVER meetings and provide technical assistance as necessary.

The IMC will establish a process for an external team of experts to advise IMC staff on technical matters such as peer review. Selected members of this team will be convened on an as needed basis.

## **Activities beyond the scope of IMC**

- Leading the development of statements of work for PDTs and RECOVER modeling contracts
- Providing guidance or assistance for non-modeling tasks associated with CERP projects.

Performing work (CERP or non-CERP) not specifically requested by a PDT, RECOVER, or senior management of the SFWMD and the Corps.

## **GUIDANCE:**

**Management of Modeling Data and Information** - CERP (and RECOVER) modeling is a primary consumer of CERP (and RECOVER) data. This modeling also produces a large volume of information in the form of model output or “results.” This information must be documented, preserved, and made accessible to IMC customers, coordinating agencies and others. The IMC will rely heavily on the CERP shared information network and CERP data management system being implemented as part of the CERP Data Management Program. IMC team leaders will participate in data management strategic development and communicate the requirements of the IMC to the CERP technology and data project teams.

**Modeling for Project Delivery Teams** - The following guidance may be used by the PDTs to obtain modeling and other technical support for their projects and to coordinate with the IMC for IMC services:

### **Regional Hydrologic Modeling**

- RECOVER and each CERP sub-region will be assigned one or more modeling liaisons to coordinate regional hydrologic modeling. They are also members of the Project Delivery Teams and will provide input to the preparation of modeling request to IMC. Preparation of the modeling request

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is the responsibility of the CERP project manager and it should be communicated to the IMC team leaders. The modeling liaisons will be familiar with issues and lead the regional modeling necessary for RECOVER or the PDTs they represent.

- PDTs and RECOVER are responsible for preparing a clear statement of questions and/or requirements that need regional hydrologic modeling. The statement should include a detailed description stating why regional modeling is needed, specific modeling objectives, desired performance measures, and a range of alternative scenarios that would be investigated through modeling. This statement will be sent directly to the IMC team leaders. Once approved by the IMC team leaders, modeling liaisons, in coordination with RECOVER or the project manager of particular PDTs, will prepare a work plan and a schedule for carrying out the specified modeling tasks. The PDTs and RECOVER will be responsible for providing any data sets and assumptions to be modeled.
- All hydrologic modeling results will be documented and presented to the PDTs or RECOVER by the modeling liaisons or others recommended by the IMC team leaders. Modeling liaisons will also be responsible for providing specific modeling outputs, boundary conditions, and other information that will be necessary for integration of any sub-regional or project specific modeling tasks.

**Sub-regional and Project Specific Hydrologic Modeling** - For analysis of alternatives, and preparation of Project Implementation Reports (PIRs), PDTs may need to use models that have higher resolutions than provided by available regional-scale and ecological models (i.e. SFWMM-“2x2”, ELM etc.). Some projects may require modeling at a higher resolution for large sub-regions (e.g. Decompartmentalization). Most projects will require project specific modeling to address specific issues relevant to the project or the site. It is expected that much of this modeling will be conducted by contracting with qualified consulting firms. In some cases however (e.g. SFRSM applications), IMC and/or other SFWMD or Corps resources may offer sub-regional modeling support.

The following guidance may be used by PDTs to obtain sub-regional and project specific modeling support for their projects:

- All statements of work must include a clear statement of questions and/or requirements that need sub-regional and/or project specific modeling. The

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statement must specify modeling objectives, desired performance measures, and a range of alternative scenarios to be investigated through modeling. This statement will be sent to the IMC team leaders for review and approval. Once approved by the IMC, the IMC, the HSM Division of the SFWMD, or the H&H Branch of the Corps will procure any contract services needed to meet modeling and modeling related requirements of the PDTs.

- Contractor(s) must present and receive IMC approval of their modeling approach prior to initiation of any work. This is necessary to ensure consistency, quality and the proper linkage to other models. Modeling tools employed by contractors must be approved by the IMC.

**Ecological Modeling** - The IMC will include ecological modeling and will provide information on the best available modeling tools that will be used for evaluating CERP projects. If modeling services are required, PDTs are responsible for submitting a clear statement of modeling issues, questions to be answered, objectives, and performance measures for review and approval by the IMC.

**Water Quality Modeling** - The IMC will include water quality modeling and will provide information on the best available modeling tools that will be used for evaluating CERP projects. If modeling services are required, PDTs are responsible for submitting a clear statement of modeling issues, questions to be answered, objectives, and performance measures for review and approval by the IMC.

**Hydrodynamic Modeling** - The IMC will include hydrodynamic modeling and will provide information on the best available modeling tools that will be used for evaluating CERP projects. If modeling services are required, PDTs are responsible for submitting a clear statement of modeling issues, questions to be answered, objectives, and performance measures for review and approval by the IMC.

**Flood Protection Issues** - Flood protection issues will be reviewed by the IMC and conduct or coordinate modeling tasks associated with flood protection investigations sponsored by PDTs. This will develop a standard set of modeling protocols consistent with the policy guidance given by CERP. A basis of

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assessment will be established for the purposes of determining flood protection level of service.

**Modeling for RECOVER** - RECOVER may use the following guidance for obtaining modeling support.

- IMC will conduct and/or facilitate all modeling support for RECOVER.

The IMC has the following responsibilities to RECOVER:

- Conduct modeling simulations required for the system-wide and sub-regional evaluation of each PIR with coordination from RECOVER's Regional Evaluation Team
- Work closely with the Regional Evaluation Team to incorporate new performance measures in the predictive models
- Develop and maintain a web-page to display predicted performance generated from the predictive models
- Conduct modeling for the refinement of the Comprehensive Plan, in coordination with the RECOVER's Comprehensive Plan Refinement Team throughout the implementation process
- Document, archive, and distribute model information, including input, output, and source code

## **APPLICATION:**

Effectively immediately, all PDTs and RECOVER staff will use the guidance provided in this memorandum to obtain modeling services for all CERP projects.

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# CERP Guidance Memorandum

South Florida Water Management District – Jacksonville District, U.S. Army Corps Of Engineers

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CGM NUMBER-REVISION: 030.00

## APPROVALS:



**John R. (Jack) Maloy**  
Chief Executive Consultant, Water Resources  
South Florida Water Management District

DATE: 28 July 03



**Dennis R. Duke**  
CERP Program Manager,  
U.S. Army Corps of Engineers

DATE: 22 July 2003

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## **Exhibit A**

### **Interagency Modeling Center Concept Agreement 29 April 2003**

**Vision:** The Comprehensive Everglades Restoration Program (CERP) requires an unprecedented volume of numerical simulation modeling to estimate the performance of proposed projects. In order to increase the synergy among the Jacksonville District of the U. S. Army Corps of Engineers (Corps), the South Florida Water Management District (SFWMD), and other agencies and stakeholders, the Corps and the SFWMD are creating an Interagency Modeling Center (IMC). The IMC will be the umbrella organization for organizing, integrating, and supplementing available modeling resources as necessary to accomplish CERP requirements. The Corps and the SFWMD have worked closely to develop a shared vision of an IMC, formed and staffed the IMC by Corps and SFWMD employees and their contractors, and included participants from other agencies. The purpose of this document is to provide direction for the implementation of the IMC.

**Concepts:** The IMC is in the later stages of concept development. Detailed implementation planning is underway as is actual implementation. The IMC's primary function is to fulfill the modeling requirements of CERP. Additionally, other southern Florida modeling requirements of joint interest to the Corps and the SFWMD may be performed by the IMC when necessary and as capacity allows. The IMC is under the joint technical direction of the Corps' Chief of the Hydrology and Hydraulics Branch and the SFWMD's Director of the Hydrologic Systems Modeling Division. Accordingly, they are responsible for the technical integrity of products from the IMC. The IMC will be physically located in the vicinity of West Palm Beach, Florida. The IMC is expected to be in operation as long as the CERP modeling demands require. Implementation of the IMC and certain model development will be a CERP programmatic cost while production work will be charged to specific projects or programs

**IMC Responsibility Umbrella:** The IMC is responsible for meeting all modeling needs of CERP and coordinating, reviewing, and approving any CERP modeling performed outside of the IMC by others including contractors. This includes support for the RECOVER program (REstoration COordination and VERification) and support for CERP and non-CERP water management control system operations. The IMC will

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provide or will coordinate and review other modeling contract efforts to support individual CERP projects. CERP modeling covers a range of model spatial scales and types.

## Types of Modeling

- Hydrologic
- Hydraulic
- Hydrodynamic
- Water Quality
- Ecological

## Model Spatial Scales

- Regional
- Sub-Regional
- Project Specific

**Phased Implementation:** The IMC is being implemented in three stages. The three stages are integrated to form an overall implementation approach and applies interim, near-term, and long-term strategies simultaneously. The three stages are defined as:

- **Stage One:** Implement improved methods of delivering modeling services to PDTs and RECOVER during interim period of 2003 or until Stage 1 IMC is fully operational. Includes establishing process for joint prioritization of regional runs; creating process for assisting PDTs and RECOVER in model selection, and for reviewing scopes and results for contracted modeling services for subregional efforts.
- **Stage Two:** Second stage of IMC implementation focuses on building capacity to providing all CERP required regional modeling services, including ecological and water quality modeling for projects and RECOVER. During this phase, the IMC will become fully capable for regional hydrologic simulation modeling and will expand capabilities to support and manage, as needed, other required CERP modeling on the subregional scale.
- **Stage Three:** Fully implemented IMC with capacity to provide (managing, coordinating, and providing oversight and approval as necessary, using contractors as necessary) all CERP required modeling services (RECOVER, regional, sub-regional, site specific, water quality, ecological, etc.).

During these three stages of development, the Corps, the SFWMD, will manage regional hydrologic modeling responsibilities for CERP as depicted in Figure 1. The Corps and the SFWMD will share the responsibilities of primary model development for the SFWMM (2x2) and the SFRSM and the training of their staff and modelers assigned to the IMC. Training will also be provided to staff of other agencies that make a

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commitment to participate in IMC. The IMC will be responsible for further regional hydrologic model development only as it relates to specific applications of the models for CERP. Additionally, the IMC will be responsible for specific CERP production modeling applications. As part of these model implementation and applications and production responsibilities, the IMC will manage the PDT and RECOVER interface with modeling liaisons. Ideally, modeling liaisons will be permanent employees of either the Corps or the SFWMD.

**Initial IMC Management:** The IMC will initially be managed on a day to day basis by Jayantha Obeysekera, SFWMD, and Russell Weeks, Corps, with management oversight and direction from their respective supervisors, John Mulliken and John Hashtak. The group, supported by contractors and other staff, will meet routinely with Jack Maloy and Dennis Duke to review progress and production, resolve issues, and plan for future improvements in the IMC implementation process. The group will also have responsibility to complete a CERP Guidance Memorandum (CGM) and a Project Management Plan (PMP) for the IMC.

**Implementation Strategy:** As the IMC is further developed and implemented, the concepts outlined here will be detailed and further documented and eventually this document will be superseded. At present, this document is to establish understanding of common vision and serve as a guide to the initial phase of IMC implementation.

**Approvals:** The contents of this document are agreed by the CERP leadership of the CORPS and SFWMD and by their authority are to be implemented and communicated immediately.

This document was executed on 29 April 2003 by Jack Maloy and Dennis Duke (signed copies available)

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**John R. (Jack) Maloy**

Chief Executive Consultant, Water Resources  
South Florida Water Management District

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**Dennis R. Duke**

CERP Program Manager  
US Army Corps of Engineers

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

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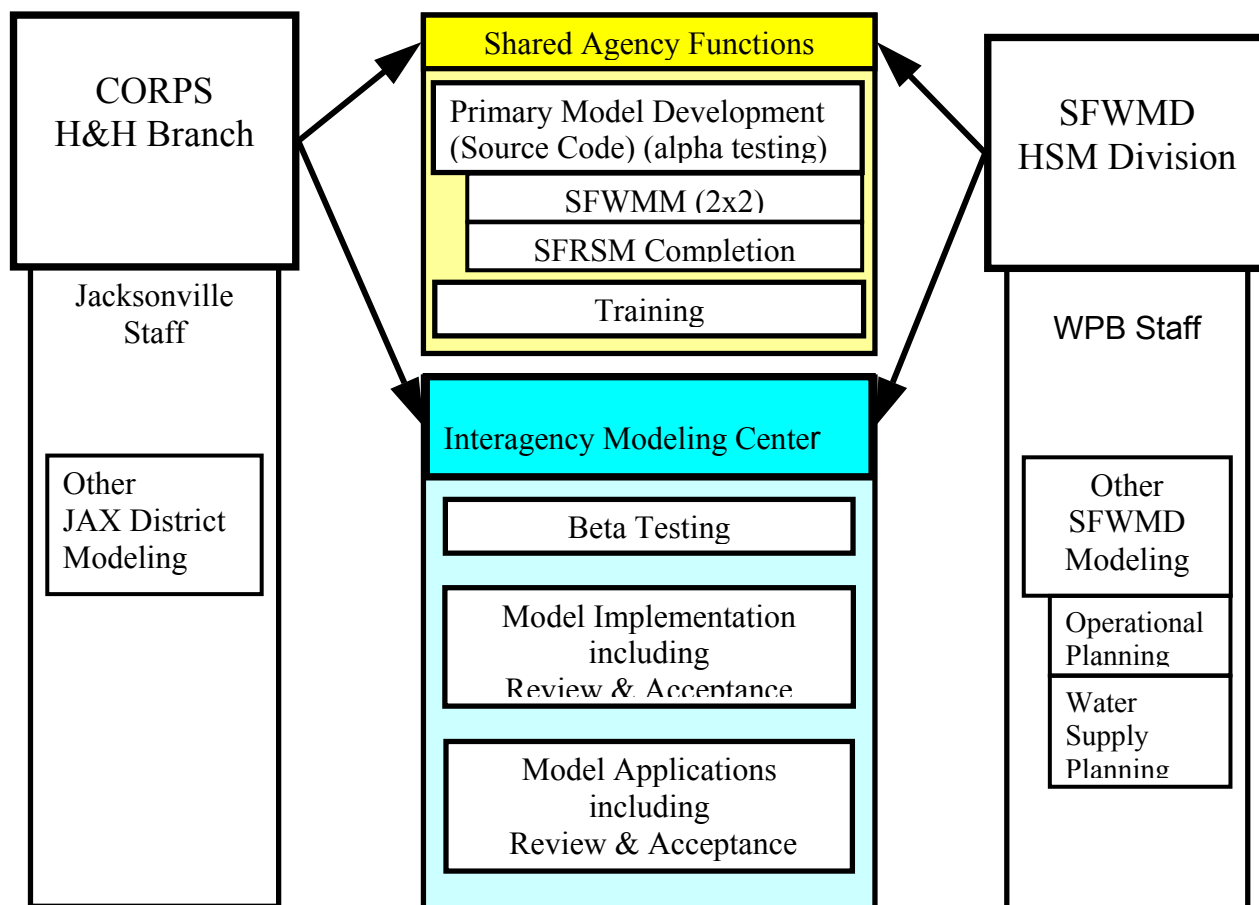
# CERP Guidance Memorandum

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**Figure 1. Regional Hydrologic Modeling Responsibilities**



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# CERP Guidance Memorandum

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## **Exhibit B**

### **IMC Coordination with PDT and RECOVER Agreements**

1. Regional modeling IMC liaisons will attend PDT meetings. (Obey to provide list).
2. All regional modeling (RECOVER & PDTs) requests and peer review requests should be submitted to the IMC team leaders: Larry Stout, Corps, or Akin Owosina, SFWMD.
3. The IMC team leaders, Larry Stout, Corps, and Akin Owosina, SFWMD, are the points of contact for the following issues:
  - Regional Model consistency
  - Approval of Project Specific Model Scopes
  - Disagreements between SFWMD and the Corps
4. Upon request, peer review of model algorithms will be performed outside the IMC by the SFWMD and Corps staff or their contractors. Model applications will be peer reviewed as necessary by the IMC staff or its contractors. Project-specific peer review will be a project-specific cost, including peer review of model applications. Peer review that will be applied to many projects will be a programmatic cost.
5. IMC will perform QA/QC for sub-regional model results for their consistency with regional modeling assumptions prior to PDT posting on website for interagency and public review.
6. Documentation of interpretation of modeling assumptions into water management (IMC – system, PDT – project specific). IMC liaisons will provide the QA/QC.
7. Regional model runs for RECOVER's system-wide analysis in the plan formulation process and other model RECOVER requests, including sub-regional, will be a RECOVER programmatic cost.

PDTs are responsible for providing modeling assumptions to be included in the regional-scale modeling.

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DESIGN AGREEMENT  
BETWEEN  
THE DEPARTMENT OF THE ARMY  
AND  
SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
FOR THE DESIGN OF ELEMENTS OF THE  
COMPREHENSIVE PLAN FOR THE EVERGLADES AND SOUTH FLORIDA  
ECOSYSTEM RESTORATION PROJECT

ORIGINAL

THIS AGREEMENT entered into this 12<sup>th</sup> day of May, 2000, by and between the Department of the Army (hereinafter the "Government") represented by the Assistant Secretary of the Army (Civil Works) and South Florida Water Management District (hereinafter the "Non-Federal Sponsor") represented by the Chairman of its Governing Board.

WITNESSETH, THAT:

WHEREAS, the Energy and Water Development Appropriations Act for Fiscal Year 2000, Public Law 106-50, included funds for the Government to initiate design (as defined in Article I.B. of this Agreement) of elements of the Comprehensive Plan for the Everglades and South Florida Ecosystem Restoration Project (hereinafter the "Program" as defined in Article I.A. of this Agreement) at South Florida;

WHEREAS, Section 105(c) of Public Law 99-662 (33 U.S.C. Section 2215), provides that the costs of design of a water resources project shall be cost shared in the same percentage as the purposes of the Program; and

WHEREAS, Section 528(e) of the Water Resources Development Act of 1996, Public Law 104-303, and Government policy requires that the Non-Federal Sponsor cost share shall be 50 percent for the Program; and

WHEREAS, Section 208(d) of the Water Resources Development Act of 1999, Public Law 106-53, provides that the Secretary of the Army shall afford credit for work performed by Non-Federal interests at the request of the Secretary of the Army in furtherance of the design of Program features; and

WHEREAS, the Government and the Non-Federal Sponsor agree that the Non-Federal Sponsor shall contribute 50 percent of the financial obligations for design of the Program; and

WHEREAS, the Government and Non-Federal Sponsor have the full authority and capability to perform as hereinafter set forth and intend to cooperate in contributing to the design in accordance with the terms of this Agreement.

NOW, THEREFORE, the Government and the Non-Federal Sponsor agree as follows:

## ARTICLE I - DEFINITIONS AND GENERAL PROVISIONS

For purposes of this Agreement:

A. The term "Program" shall mean those separable elements listed in Attachment "A" and incorporated herein by reference as if set out verbatim. Each separable element is generally described in the Central and Southern Florida Project, Comprehensive Review Study, Final, Integrated Feasibility Report and Programmatic Environmental Impact Statement, dated April 1999 and approved by the Assistant Secretary of the Army (Civil Works), on July 1, 1999 ("Comprehensive Plan"). Each separable element of the Program is also sometimes referred to herein as a "Project".

B. The term "design" shall mean all activities directly related to planning, engineering and design of the Program for which financial obligations are made or for which work is performed by either party's own forces in accordance with the terms of this Agreement, including, but not limited to the following: (1) during the period of design, preparation of the Master Program Management Plan and annual updates to the Master Program Management Plan, Project Management Plans, Project Implementation Reports, general and detailed design memoranda, plans, drawings, and specifications; (2) during the period of design, preparation of required documentation for compliance with National Environmental Policy Act, and other applicable Federal and state laws; (3) preparation and processing of applications for any Federal, State or local permits required for the design of the Program through the period of construction set forth in applicable Project Cooperation Agreements for construction of the separable Program elements and any activities required to comply with the conditions of such permit(s) during the period of construction as appropriate; (4) during the period of design, attendance by the appropriate representatives of the Non-Federal Sponsor at pre-application conferences with applicable state and federal regulatory agencies in accordance with section 373.1501, F.S. (1999) and attendance by Government representatives, as appropriate; (5) during the period of design, the legal defense of design activities in administrative hearings and in judicial proceedings, including the selection of outside counsel and expert witnesses where both parties agree such outside assistance is necessary and economical; (6) during the period of design, activities related to restoration, coordination, and verification as identified in the Comprehensive Plan, which includes, but is not limited to, adaptive assessment, monitoring, peer review, development and refinement of system level analytical model tools, and continuing review and refinement of the Comprehensive Plan; and (7) engineering and design through the period of construction set forth in applicable Project Cooperation Agreements for construction of the separable Program elements. The term shall not include any activities performed as part of reconnaissance or feasibility studies, or activities conducted as part of negotiation of Project Cooperation Agreements for separable elements of the Program, or any permits required for the operation and maintenance of a separable element of the Program after the period of construction of each separable element.

C. The term "total design costs" shall mean all costs incurred by the Non-Federal Sponsor and the Government in accordance with the terms of this Agreement directly related to design of the Program. The term includes but is not necessarily limited to, costs associated with completing all aspects of the design as delineated in Article I.B of this Agreement; applicable planning and evaluation; applicable engineering and design; environmental assessment and documentation; the identification, survey, and evaluation of historic properties; participation in the Design Coordination Team in accordance with Article III of this Agreement; costs of the interim and final accounting in accordance with Article IV.D. of this Agreement; and costs of maintenance of records and audit in accordance with Article VII of this Agreement. Design costs include, but are not necessarily limited to, labor charges, direct costs, overhead expenses, supervision and administrative costs, costs of contracts with third parties, including costs incurred with regard to contract disputes, suspensions, or terminations. The term does not include any costs related to betterments; any costs of dispute resolution under Article V of this Agreement; any costs incurred as part of reconnaissance studies or feasibility studies; any costs (other than audit) resulting from financial obligations after the period of design; any permit application fees charged to the Non-Federal Sponsor for Federal, State and local permits, except to the extent those fees would apply equally to the Government if it were seeking the permit in its own name; or any costs of negotiating Project Cooperation Agreements for separable elements of the Program.

D. The term "period of design" shall mean the time period for designing Program elements commencing on April 7, 1999 when the Notice of Intent from the Division Engineer of the U.S. Army Corps of Engineers, South Atlantic Division to submit the Comprehensive Plan to Congress was released and ending when the design of all Program elements are completed or when this Agreement is terminated by the parties in accordance with Article XI of this Agreement, whichever is sooner.

E. The term "in-kind services" shall mean work items to be performed by the Non-Federal Sponsor's own forces or performed by Non-Federal Sponsor's contractor(s) in furtherance of the design of separable Program elements.

F. The term "District Engineer" shall mean the U.S. Army Engineer for the Jacksonville District.

G. The term "fiscal year" shall mean one fiscal year of the Government. The Government fiscal year begins on October 1 and ends on September 30.

H. The term "betterment" shall mean a change in the design of an element of the Program resulting from the application of standards that the Government determines exceed those that the Government would otherwise apply for accomplishing the design and construction of that element, or the addition of an element of the Program that the Government would not otherwise accomplish.

I. The term "financial obligations for design" shall mean a financial obligation of the Government and/or the Non-Federal Sponsor that results or would result in a cost that is or would be included in total design costs in accordance with paragraph C of this Article.

J. The term "non-Federal proportionate share" shall mean the ratio of the Non-Federal Sponsor's total contribution required in accordance with Article II.C. of this Agreement to total financial obligations for design, as projected by the Government.

## ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND THE NON-FEDERAL SPONSOR

A. In accordance with Article XIII of this Agreement, the Government and the Non-Federal Sponsor shall expeditiously design the Program, applying those procedures usually applied to the engineering and design of Federal projects, pursuant to applicable Federal and State laws, regulations, and policies. Each party shall perform or cause to be performed certain design work as further described in this Article. To facilitate completion of the Program design, the parties intend to cooperate closely to minimize disputes and mutually agree upon the work to be performed by each party.

B. No later than ninety (90) days after the Effective Date of this Agreement, the parties, in consultation with the Design Coordination Team referred to in Article III of this Agreement, shall complete a Master Program Management Plan. The Master Program Management Plan shall set forth the parties' expectations for proceeding with the design of the Program and establish a framework for managing and monitoring the Program design effort. Prior to the beginning of each fiscal year, the Master Program Management Plan shall be updated to incorporate any changes. The parties shall proceed in accordance with the Master Program Management Plan and any updates thereto to the maximum extent practicable. The parties will cooperate in revising or adjusting the Master Program Management Plan to ensure that the goals and objectives of the Program are met. All updates, adjustments, changes or revisions to the Master Program Management Plan shall be mutually agreed to in writing by the parties' authorized representatives.

1. The Master Program Management Plan shall include i) descriptions and cost estimates of the design work to be performed by either party, whether through third party contractors or using either party's own forces, ii) performance schedules with deadlines, including schedules for developing Project Management Plans, Project Implementation Reports, and Detailed Design Reports, iii) a schedule for planning and implementing restoration, coordination, and verification activities described in the Comprehensive Plan and the work assignments for each party for implementing these activities, and iv) a budget for the first two fiscal years of the period of design (fiscal years 1999 and 2000) and a budget for each subsequent fiscal year during the period of design.

2. As will be set forth in the Master Program Management Plan, the parties, in consultation with the Design Coordination Team, shall develop a Project Management Plan for each Project covered by this Agreement. The Project Management Plan shall include a detailed scope of work, schedules and cost estimates covering all planning, engineering and design efforts, and shall identify the work assigned to each party. Once a Project Management Plan is approved by the parties, work assigned in a Project Management Plan to the Non-Federal Sponsor shall be

deemed requested by the Secretary of the Army as in-kind services for which the Non-Federal Sponsor is entitled to receive credit in accordance with Section 208(d) of the Water Resource Development Act of 1999, Public Law 106-53. The parties shall then proceed with design of separable Program elements and produce a Project Implementation Report for each Project in accordance with the approved Project Management Plan. Subsequent design products for each Project shall include, as necessary, a Detail Design Report and construction plans and specifications.

3. The following work products shall be subject to approval by the Government and Non-Federal Sponsor: the initial Master Program Management Plan, including a detailed budget for the upcoming fiscal year and a 5-year budget forecast; annual updates of the Master Program Management Plan, including a detailed budget request for the upcoming fiscal year and updated 5-year budget forecasts; Project Management Plans for Projects; Project Implementation Reports for Projects, if developed; Detailed Design Reports, if developed, to the 30 per cent level of detail, and construction plans and specifications, if developed.

4. The award and management of any contract by the Government with a third party in furtherance of this Agreement which obligates Federal appropriations shall be exclusively within the control of the Government but shall be subject to applicable laws and regulations. The award and management of any contract by the Non-Federal Sponsor with a third party in furtherance of this Agreement which obligates funds of the Non-Federal Sponsor shall be exclusively within the control of the Non-Federal Sponsor but shall be subject to applicable Federal and State laws, regulations, and Executive Orders of the Governor of the State of Florida. The Government and the Non-Federal Sponsor shall offer each other the opportunity to review and comment on the solicitations for all contracts, including relevant scopes of work, prior to the issuance of such solicitations. To the extent possible, the Government and the Non-Federal Sponsor shall afford each other the opportunity to review and comment on all contracts modifications, including change orders, prior to the issuance to the contractor of a Notice to Proceed. In any instance where providing each other with notification of a contract modification or change order is not possible prior to issuance of the Notice to Proceed, the issuing party shall provide such notification in writing at the earliest date possible. To the extent possible, the Government and the Non-Federal Sponsor shall afford each other the opportunity to review and comment on all contract claims prior to resolution thereof. Each party shall consider in good faith the comments of the other, but the contents of solicitations, award of contracts, execution of contract modifications, issuance of change orders, resolution of contract claims, and performance of all design (whether the work is performed under contract or by in-house personnel), shall be exclusively within the control of the party that is responsible for the design of the particular Project or separable element.

C. The Non-Federal Sponsor shall provide, during the period of design, a contribution of in-kind services and, if necessary, cash contribution(s) equal to 50 percent of the total design costs, in accordance with the provisions of this paragraph.

1. As authorized by Section 208 of Public Law 106-53, the Government may afford credit for the in-kind services. The affording of such credit shall be subject to a technical review



by the Government to verify that the credited work was accomplished in a satisfactory manner and in accordance with the limitations contained in this Agreement. To afford any such credit, the Government shall apply the amount of credit toward the Non-Federal Sponsor's share of total design costs and such credit shall likewise be applied toward the cash contribution required by paragraph C.2. of this Article. The amount of credit shall not exceed the Non-Federal Sponsor's actual costs attributable to the in-kind services. The amount of credit shall be subject to an audit in accordance with Article VII.C. of this Agreement to determine reasonableness, allocability, and allowability of costs. The amount of credit shall not exceed the Non-Federal Sponsor's share of total design costs.

2. If the Government projects that the value of the Non-Federal Sponsor's contributions under paragraph C.1. of this Article and Articles III and VII of this Agreement will be less than 50 percent of total design costs, the Non-Federal Sponsor shall provide a cash contribution, in accordance with Article IV.B. of this Agreement, in the amount necessary to make the Non-Federal Sponsor's total contribution of in-kind services and cash equal to 50 percent of total design costs.

3. If the Government determines that the value of the Non-Federal Sponsor's contributions provided under paragraphs C.1. and C.2. of this Article and Articles III and VII of this Agreement has exceeded 50 percent of total design costs, the procedures specified in Article IV.D.2. of this Agreement shall govern.

D. The Government and the Non-Federal Sponsor shall perform a final accounting in accordance with Article IV.D. of this Agreement to determine the contributions provided by the Non-Federal Sponsor in accordance with paragraphs C. and F. of this Article and to determine whether the Non-Federal Sponsor has met its obligations under paragraphs C. and F. of this Article.

E. The Non-Federal Sponsor shall not use Federal funds to meet the Non-Federal Sponsor's share of total design costs under this Agreement unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

F. The Non-Federal Sponsor may request the Government to design betterments. Such requests shall be in writing and shall describe the betterments requested to be designed. If the Government in its sole discretion elects to design the requested betterments or any portion thereof, it shall so notify the Non-Federal Sponsor in a writing that sets forth any applicable terms and conditions, which must be consistent with this Agreement. In the event of conflict between such a writing and this Agreement, this Agreement shall control. The Non-Federal Sponsor shall be solely responsible for all costs due to the requested design of betterments and shall pay all such costs in accordance with Article IV.C. of this Agreement.

G. This Agreement shall not be construed as obligating either party to seek funds for, or to participate in, construction or implementation of the Program or a separable element thereof.

H. In addition to any other limitations contained in this Agreement, the affording and the amount of credit for in-kind services is subject to the following additional limitations.

1. No credit shall be given unless and until the District Engineer has certified that the in-kind services subject to credit pursuant to this Agreement have been performed in accordance with this Agreement.

2. The amount of credit for which the Non-Federal Sponsor may be eligible pursuant to this Agreement is not subject to interest charges, nor is it subject to adjustment to reflect changes in price levels between the time the in-kind services are completed and the time that the credit is afforded.

3. The Non-Federal Sponsor shall obtain all applicable Federal, State and local permits required for the performance of the in-kind services related to design of the Program.

### ARTICLE III - DESIGN COORDINATION TEAM

A. To provide for consistent and effective communication, the Non-Federal Sponsor and the Government, not later than 30 days after the Effective Date of this Agreement, shall appoint named senior representatives to a Design Coordination Team. Thereafter, the Design Coordination Team shall meet regularly until the end of the period of design. A technical representative of the Florida Department of Environmental Protection shall be invited to participate in Design Coordination Team activities. The Government's Program Manager and the Non-Federal Sponsor's Program Manager shall co-chair the Design Coordination Team.

B. The Government's Program Manager and the Non-Federal Sponsor's Program Manager shall keep the Design Coordination Team informed of the progress of the design and of significant pending issues and actions, and shall seek the views of the Design Coordination Team on matters that the Design Coordination Team generally oversees.

C. Until the end of the period of design, the Design Coordination Team shall generally oversee issues related to design, including review of: 1) design schedules and budgets; 2) design plans and work products including, Project Management Plans, Project Implementation Reports, and Detailed Design Reports; 3) construction plans and specifications; 4) proposed updates of the Master Program Management Plan; 5) real property and relocation requirements for construction or implementation of the Program; 6) contract scopes of work, modifications and contract costs; 7) Program and Project cost projections; 8) anticipated requirements and needed capabilities for performance of operation, maintenance, repair, replacement and rehabilitation of a Project; 9) restoration, coordination, and verification as described in the Comprehensive Plan; and 10) other related matters. The goal of this review, among other things, shall be to ensure, to the maximum extent practicable, that the Government and the Non-Federal Sponsor agree on the design work that is to be performed under this Agreement and the scheduling and total design costs for that work.

D. Until the end of the period of design, the Design Coordination Team shall regularly review the following items to assure that the design work is proceeding cost-effectively and within budget: 1) each party's contribution of funds and services to the Program; 2) total costs due to betterments; 3) a comparison of the total design cost estimates to the actual total design costs when incurred; 4) updated projections of separable Program element costs and total design costs, and the amount of funding and in-kind services required from the parties for the upcoming fiscal year; and 5) staff time and design expenses incurred by each party. The parties also agree to work together towards maximizing opportunities for participation by small businesses and minority/women owned businesses in accordance with each party's respective policies and programs for such initiatives.

E. The Design Coordination Team may make recommendations that it deems warranted to the District Engineer and the Non-Federal Sponsor's Executive Director or their designees on matters that the Design Coordination Team generally oversees, including suggestions to avoid potential sources of dispute. The Government and the Non-Federal Sponsor in good faith shall consider the recommendations of the Design Coordination Team.

F. The costs of participation of the Government and the Non-Federal Sponsor in the Design Coordination Team during the period of design shall be included in total design costs and cost shared in accordance with the provisions of this Agreement.

#### ARTICLE IV - METHOD OF PAYMENT

A. Until the Government furnishes the Non-Federal Sponsor with the results of the final accounting, the Government and the Non-Federal Sponsor shall maintain current records of contributions provided by each other and current projections of total design costs and costs due to additional work under Articles II.F. and XIV of this Agreement. At least quarterly, the Government and the Non-Federal Sponsor shall provide each other with a report setting forth all contributions provided to date and the current projections of the following: (1) total design costs; (2) total costs due to additional work under Articles II.F. and XIV of this Agreement; (3) each party's share of total design costs; (4) the non-Federal proportionate share; (5) the Non-Federal Sponsor's total contributions required in accordance with Articles II.C., II.F., and XIV of this Agreement; and (6) the funds to be required from the Non-Federal Sponsor in accordance with Articles II.C., II.F., and XIV of this Agreement for the upcoming fiscal year. On the Effective Date of this Agreement, total design costs are projected to be \$712,466,028, and the Non-Federal Sponsor's total contribution, including cash and in-kind services, required under Article II.C. of this Agreement is projected to be \$356,233,014. Such amounts are estimates subject to adjustment by the Government and the Non-Federal Sponsor and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

B. If necessary, the Non-Federal Sponsor shall provide the cash contribution required under Article II.C. of this Agreement in accordance with the provisions of this paragraph.

1. Not later than 30 calendar days after the completion of the Master Program Management Plan, the Government shall notify the Non-Federal Sponsor in writing of the cash contribution the Government, after consideration of any in-kind services contributions by the Non-Federal Sponsor pursuant to Article II.C. of this Agreement, determines to be required from the Non-Federal Sponsor to meet the non-Federal proportionate share of projected financial obligations for design through the first two fiscal years of the period of design (fiscal years 1999 and 2000), including the non-Federal proportionate share of expended financial obligations for design. Not later than 60 calendar days after such notice the Non-Federal Sponsor shall provide the Government on a quarterly basis the amount of the required cash contribution, in a manner to meet all third party obligations and in-house labor, by delivering a check payable to "FAO, USAED, JACKSONVILLE" to the District Engineer, or verify to the satisfaction of the Government that the Non-Federal Sponsor has deposited the required funds in the existing escrow account which the Non-Federal Sponsor maintains on behalf of the Government, with interest accruing to the Non-Federal Sponsor, or present the Government with an irrevocable letter of credit acceptable to the Government for the required funds, or provide an Electronic Funds Transfer in accordance with procedures established by the Government.

2. If necessary, for the third (fiscal year 2001) and subsequent fiscal years of design, the Government shall notify the Non-Federal Sponsor in writing, no later than 120 calendar days prior to the beginning of that fiscal year, of the cash contributions the Government determines to be required from the Non-Federal Sponsor to meet the non-Federal proportionate share of projected financial obligations for design for that fiscal year. In calculating the amount of the cash contribution, the Government shall take into consideration the Non-Federal Sponsor's in-kind services and cash contributions for prior fiscal years as well as projected in-kind service and cash contributions for the next two fiscal years. On October 1, or the first business day of the fiscal year, the Non-Federal Sponsor shall, on a quarterly basis, make the amount of the required cash contribution for that fiscal year available to the Government through the funding mechanisms specified in paragraph B.1. of this Article in a manner to meet all third party obligations and in-house labor.

3. The Government and the Non-Federal Sponsor acknowledge that the progress of orderly work may require the Non-Federal Sponsor to provide cash or in-kind services at a rate that may result in the Non-Federal Sponsor temporarily diverging from the cost sharing obligations specified in Article II.C. of this Agreement. Such temporary divergences shall not alter the cost sharing obligations specified in Article II.C. of this Agreement. The Government shall monitor the provision of cash and in-kind services and manage, to the maximum extent practicable, the Non-Federal Sponsor's requirement to provide cash and in-kind services so that the Non-Federal Sponsor's contributions equal a 50 percent proportionate share during each three year fiscal period beginning with commencement of design of the Program.

4. If necessary, the Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover: (a) the non-Federal proportionate share of financial obligations for design incurred during the first two fiscal years of the period of design (fiscal years 1999 and 2000); and (b) the non-Federal proportionate share of financial obligations for design as they are incurred during the remainder of the period of design.

5. If necessary, after consideration of any cash and/or in-kind services contributions by the Non-Federal Sponsor pursuant to Article II.C. and Article IV.B.2. of this Agreement, if at any time during the period of design the Government determines that additional funds will be needed from the Non-Federal Sponsor to cover the non-Federal proportionate share of projected financial obligations for design for the current fiscal year, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required together with an explanation of why additional funds are required. The Non-Federal Sponsor may review and comment in writing on the request for additional funds no later than 30 days from receipt of Government's notification. The Government shall respond in writing to the Non-Federal Sponsor's comments before it is required to make payment. The Non-Federal Sponsor shall, no later than 30 calendar days from receipt of the Government's response, make the additional required funds available through the payment mechanisms specified in paragraph B.1. of this Article. The Design Coordination Team shall carry out its duties under Article III of this Agreement to provide the parties with timely cost and budgeting information to optimize the use of available funds and to prevent the award of any contract or performance of any work that would exceed available funding and to provide adequate advance notice to the Non-Federal Sponsor of any anticipated cash payment well in advance of the written notice from the Government.

C. In advance of the Government incurring any financial obligation associated with additional work under Articles II.F. and XIV of this Agreement, the Non-Federal Sponsor shall provide the Government with the full amount of the funds required to pay for such additional work by delivering a check payable to "FAO, USAED, JACKSONVILLE" to the District Engineer, or verify to the satisfaction of the Government that the Non-Federal Sponsor has deposited the full amount of the funds required to pay for such additional work in the existing escrow account which the Non-Federal Sponsor maintains, with interest accruing to the Non-Federal Sponsor, or present the Government with an irrevocable letter of credit acceptable to the Government for the required funds, or provide an Electronic Funds Transfer in accordance with procedures established by the Government. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover the Government's financial obligations for such additional work as they are incurred. In the event the Government determines that the Non-Federal Sponsor must provide additional funds to pay for such additional work, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required. The Non-Federal Sponsor may review and comment in writing on the request for additional funds no later than 30 days from receipt of Government's notification. The Government shall respond in writing to the Non-Federal Sponsor's comments before it is required to make payment. The Non-Federal Sponsor shall, no later than 30 calendar days from receipt of the Government's response, provide the Government with the full amount of the additional required funds through the funding mechanisms specified above.

D. Upon completion of design for all projects or termination of this Agreement, and upon resolution of all relevant proceedings, claims and appeals, the Government and the Non-Federal Sponsor shall conduct a final accounting. The final accounting shall determine total design costs, each party's contribution provided thereto, and each party's required share thereof. The final accounting also shall determine total costs due to additional work under Articles II.F. and XIV of

this Agreement and the Non-Federal Sponsor's contribution provided pursuant to Articles II.F. and XIV of this Agreement. The Non-Federal Sponsor may request that the Government perform an interim accounting upon completion of the design of each separable element of the Program.

1. In the event the final accounting shows that the total contribution provided by the Non-Federal Sponsor under Article II.C. of this Agreement is less than its required 50 percent share of total design costs plus costs due to additional work under Articles II.F. and XIV of this Agreement, the Non-Federal Sponsor may no later than 30 calendar days after receipt of written notice (which provides an explanation of why additional funds are required) review and comment in writing on the request for additional funds. The Government shall respond in writing to the Non-Federal Sponsor's comments before the Non-Federal Sponsor is required to make payment. The Non-Federal Sponsor shall, no later than 30 calendar days from receipt of the Government's response, make a payment to the Government of whatever sum is required to meet the Non-Federal Sponsor's required 50 percent share of total design costs plus costs due to additional work under Articles II.F. and XIV of this Agreement. The Design Coordination Team shall carry out its duties under Article III of this Agreement to provide the parties with timely cost and budgeting information to optimize the use of available funds and to prevent the award of any contract or performance of any work that would exceed available funding and to provide adequate advance notice to the Non-Federal Sponsor of any anticipated cash payment well in advance of the written notice from the Government.

2. In the event the final accounting shows that the total contribution provided by the Non-Federal Sponsor exceeds its required 50 percent share of total design costs plus costs due to additional work under Articles II.F. and XIV of this Agreement, the Government shall, subject to the availability of funds, refund the amount of the excess contribution to the Non-Federal Sponsor no later than 90 calendar days after the final accounting is complete. In the event existing funds are not available to refund the excess to the Non-Federal Sponsor, the Government shall seek such appropriations as are necessary to make the refund or the Non-Federal Sponsor may elect to apply the amount in excess of its required 50 percent contribution as a credit attributable to the Program during the construction or implementation of a separable element of the Program.

## ARTICLE V - DISPUTE RESOLUTION

A. The parties shall cooperate in good faith in resolving disputes under this Agreement at the lowest organizational level before seeking to elevate a dispute. With regard to any dispute under this Agreement, including but not limited to: 1) the failure to complete or update the Master Program Management Plan or Project Management Plans; 2) a dispute with regard to a proposed change to the Master Program Management Plan or a Project Management Plan; or 3) a party's failure to approve a matter as provided under this Agreement, and as a condition precedent to a party bringing any suit for breach of this Agreement, the party must first notify the other party in writing of the nature of the purported breach or other dispute and seek in good faith to resolve the dispute through negotiation. The parties shall first refer the matter for resolution to the Program managers in consultation with the Design Coordination Team. If not resolved, the matter shall be elevated for resolution to the Deputy District Engineer for Programs and Project

Management for the Jacksonville District and the Non-Federal Sponsor's Deputy Executive Director for Water Resource Management, or their designees. If not resolved, the matter shall be elevated to the District Engineer, U.S. Army Corps of Engineers, Jacksonville District, and the Non-Federal Sponsor's Executive Director, or their designees. If not resolved, the matter may be further elevated to the Division Engineer of the U.S. Army Corps of Engineers, South Atlantic Division, or a designee. If not resolved, the matter may be further elevated to the Chief of Engineers, or a designee. If not resolved, the matter may be further elevated to the Assistant Secretary of the Army for Civil Works, or a designee, for a decision on the dispute and whose decision shall be final.

B. At any time, the parties may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to both parties. The parties shall each pay 50 percent of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

C. Once dispute resolution has been exhausted, the parties may avail themselves of any remedies available at law or in equity. Either party may also elect not to initiate follow-on work relating to separable Program elements at the following decision points: (1) after completion of a Project Management Plan; or (2) after completion of a Project Implementation Report; or (3) after completion of a Detailed Design Report to the 30 percent level of detail.

#### ARTICLE VI - HOLD AND SAVE

The Non-Federal Sponsor shall hold and save the Government free from all damages arising from the design for the Program and design for any Program-related betterments, except for damages due to the fault or negligence of the Government or its contractors.

#### ARTICLE VII - MAINTENANCE OF RECORDS AND AUDIT

A. Not later than 60 calendar days after the Effective Date of this Agreement, the Government and the Non-Federal Sponsor shall develop procedures for keeping books, records, documents, or other evidence pertaining to total design costs and expenses incurred pursuant to this Agreement. These procedures shall incorporate, and apply as appropriate, the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 C.F.R. Section 33.20. The Government and the Non-Federal Sponsor shall maintain such books, records, documents, or other evidence in accordance with these procedures and for a minimum of three years after completion of the final accounting for which such books, records, documents, or other evidence were required in accordance with Article IV.D. of this Agreement. To the extent permitted under applicable Federal laws and regulations, the Government and the Non-Federal Sponsor shall each allow the other to inspect such books, documents, records, or other evidence.

B. Pursuant to 32 C.F.R. Section 33.26, the Non-Federal Sponsor is responsible for complying with the Single Audit Act of 1984, 31 U.S.C. Sections 7501-7507, as implemented by Office of Management and Budget (OMB) Circular No. A-133 and Department of Defense Directive 7600.10. Upon request of the Non-Federal Sponsor and to the extent permitted under applicable Federal laws and regulations, the Government shall provide to the Non-Federal Sponsor and independent auditors any information necessary to enable an audit of the Non-Federal Sponsor's and the Government's activities under this Agreement. The costs of any audits performed in accordance with this paragraph before the Government furnishes the Non-Federal Sponsor with the results of the final accounting shall be allocated in accordance with the provisions of OMB Circulars A-87 and A-133, and such costs as are allocated to the Program shall be included in total design costs and cost shared in accordance with the provisions of this Agreement.

C. In accordance with 31 U.S.C. Section 7503, the Government may conduct audits in addition to any audit that the Non-Federal Sponsor is required to conduct under the Single Audit Act. Any such Government audits shall be conducted in accordance with Government Auditing Standards and the cost principles in OMB Circular No. A-87 and other applicable cost principles and regulations. The costs of Government audits performed in accordance with this paragraph before the Government furnishes the Non-Federal Sponsor with the results of the final accounting shall be included in total design costs and cost shared in accordance with the provisions of this Agreement.

#### ARTICLE VIII - FEDERAL AND STATE LAWS

In the exercise of their respective rights and obligations under this Agreement, the Non-Federal Sponsor and the Government agree to comply with any provisions of Federal and State laws and regulations that apply to each respective party, including, but not limited to, Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulations 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army", and Chapter 373, Florida Statutes (1999), including Section 373.1501, Florida Statutes (1999).

#### ARTICLE IX - RELATIONSHIP OF PARTIES

A. In the exercise of their respective rights and obligations under this Agreement, the Government and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other.

B. In the exercise of its rights and obligations under this Agreement, neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights such other party may have to seek relief or redress against such contractor either pursuant to any cause of action that such other party may have or for violation



of any law.

#### ARTICLE X - OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, nor any resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

#### ARTICLE XI - TERMINATION OR SUSPENSION

A. If at any time the Non-Federal Sponsor fails to fulfill its obligations under this Agreement, then subject to the provisions of dispute resolution under Article V of this Agreement, the Government may terminate or suspend future performance under this Agreement.

B. If the Government fails to receive annual appropriations in amounts sufficient to meet its share of scheduled expenditures for design for the then-current or upcoming fiscal year, the Government shall so notify the Non-Federal Sponsor in writing, and 60 calendar days thereafter either party may elect without penalty to terminate this Agreement or to suspend future performance under this Agreement. In the event that either party elects to suspend future performance under this Agreement pursuant to this paragraph, such suspension shall remain in effect until such time as the Government receives sufficient appropriations or until either the Government or the Non-Federal Sponsor elects to terminate this Agreement, whichever occurs first.

C. In the event that either party elects to terminate this Agreement pursuant to this Article, both parties shall conclude their activities relating to design of the Program and proceed to a final accounting in accordance with Article IV.D. of this Agreement.

D. Any termination of this Agreement or suspension of future performance under this Agreement in accordance with this Article shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment from the Non-Federal Sponsor shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceeds 3 months.

#### ARTICLE XII - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and either delivered personally or by telegram or mailed by first-class, registered, or certified mail, or by facsimile with confirmed receipt from the recipient, as follows:

If to the Non-Federal Sponsor:

Executive Director or designee  
South Florida Water Management District  
Post Office Box 24680  
West Palm Beach, Florida 24680  
Fax Number: (561) 687-6397

If to the Government:

District Engineer or designee  
Jacksonville District  
P.O. Box 4970  
Jacksonville, Florida 32232-0019  
Fax Number (904) 232 -3692

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

C. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at the earlier of such time as it is actually received or seven calendar days after it is mailed.

#### ARTICLE XIII - OBLIGATIONS OF FUTURE APPROPRIATIONS

Nothing herein shall constitute, nor be deemed to constitute an obligation for future appropriations by the Government. The Department of the Army agrees that, consistent with the authority provided in Section 528(b) of Public Law 104-303, as amended, and the rules that govern the Executive Branch budget requests, it shall exert its best efforts to obtain the appropriations to pay for the Federal share of total design costs. Nothing herein shall constitute, nor be deemed to constitute, an obligation of future appropriations by the Legislature of the State of Florida. The Non-Federal Sponsor shall exert its best efforts to obtain the appropriations to pay the Non-Federal Sponsor share of total design costs, consistent with applicable law and rules.

#### ARTICLE XIV- DESIGN OF PROGRAM FEATURES TO IMPROVE WATER QUALITY

All separable Program elements shall be designed to take into account the improvement and protection of water quality by considering applicable water quality standards. The cost of design of water quality features already included in the Comprehensive Plan have been deemed essential to Everglades Restoration and shall be included in total design costs and cost shared in accordance with the provisions of this Agreement. Any additional water quality features to be added to a Project require the written concurrence of the Government and the Non-Federal Sponsor. Design of additional water quality features shall be paid 100 percent by the Non-Federal Sponsor unless the Government

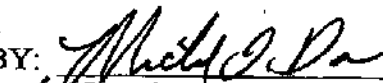
determines that such features are essential to Everglades Restoration in which case costs for such features shall be included in total design costs and cost shared in accordance with the provisions of this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date ("Effective Date") it is signed by Assistant Secretary of the Army (Civil Works).

THE DEPARTMENT OF THE ARMY

THE SOUTH FLORIDA WATER  
MANAGEMENT DISTRICT, BY ITS  
GOVERNING BOARD

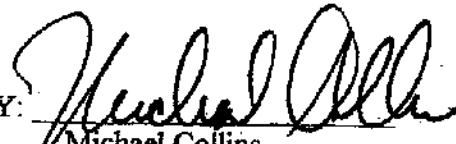
BY:

  
Joseph W. Westphal

Assistant Secretary of the Army  
(Civil Works)

Date: 12 May 2000

BY:

  
Michael Collins  
Chairman

Date: 12 May 2000

LEGAL FORM APPROVED  
SFWMD OFFICE OF COUNSEL

BY Mike Logan DATE 5/10/2000

SFWMD Procurement Approved

By Magnolia

Date 5/10/2006

# CERTIFICATE OF AUTHORITY

I, John Fumero, do hereby certify that I am the principal legal officer of the South Florida Water Management District, that the South Florida Water Management District is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the South Florida Water Management District in connection with design of the Central and South Florida Project, and that the persons who have executed this Agreement on behalf of the South Florida Water Management District have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this

10<sup>th</sup> day of May 2000.



John Fumero  
General Counsel  
South Florida Water  
Management District

## CERTIFICATION REGARDING LOBBYING

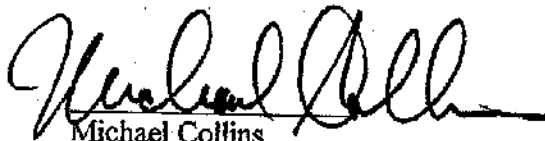
The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.



Michael Collins  
Chairman  
South Florida Water  
Management District

DATE: 12 May 2000

LEGAL FORM APPROVED  
SFWMD OFFICE OF COUNSEL  
BY Chs. Corp DATE 5/10/2000

# DESIGN AGREEMENT ATTACHMENT "A"

Project Title	Comp. Plan Section
North of Lake Okeechobee Storage Reservoir	9.1.1.1
Taylor Creek Nubbin Slough Storage and Treatment Area	9.1.1.2
Lake Okeechobee Watershed Water Quality Treatment Facilities	9.1.1.3
Lake Okeechobee Tributary Sediment Dredging	9.1.1.4
Lake Istokpoga Regulation Schedule	9.1.1.5
Lake Okeechobee Aquifer Storage and Recovery	9.1.2.1
C-43 Basin Storage Reservoir and Aquifer Storage and Recovery	9.1.3.1
Caloosahatchee Backpumping with Stormwater Treatment	9.1.3.2
C-44 Basin Storage Reservoir	9.1.4.1
C-23/C-24/C-25/Northfork and Southfork Storage Reservoirs	9.1.4.2
Everglades Agricultural Storage Reservoirs	9.1.5.1
Big Cypress/L-28 Interceptor Modifications	9.1.6.1
Flow to Northwest and Central Water Conservation Area 3A	9.1.7.1
Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement	9.1.7.2
Loxahatchee National Wildlife Refuge Internal Canal Structures	9.1.7.3
Pal-Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration	9.1.8.1
Water Preserve Areas/L-8 Basin	9.1.8.2
Acme Basin B Discharge	9.1.8.3
Lake Worth Lagoon Restoration	9.1.8.4
C-17 Backpumping and Treatment	9.1.8.6
C-51 Backpumping and Treatment	9.1.8.7
C-51 Regional Groundwater Aquifer Storage and Recovery	9.1.8.8
Palm Beach County Agricultural Reserve Reservoir and Aquifer Storage and Recovery	9.1.8.9
Protect and Enhance Existing Wetland Systems along Loxahatchee National Wildlife Refuge including the Strazzulla Tract	9.1.8.10
Site 1 Impoundment and Aquifer Storage and Recovery	9.1.8.11
Broward County Secondary Canal System	9.1.8.12
Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management	9.1.8.13
C-9 Stormwater Treatment Area/Impoundment	9.1.8.14
North Lake Belt Storage Area	9.1.8.15
Diverting Water Conservation Area 2 and 3 flows to Central Lake Belt Storage Area	9.1.8.16
Central Lake Belt Storage Area	9.1.8.17
Dade-Broward Levee/Pennsuco Wetlands	9.1.8.18
C-4 Control Structures	9.1.8.19
Bird Drive Recharge Area	9.1.8.20
L-31N Improvements for Seepage Management and S-356 Structures	9.1.8.21
Biscayne Bay Coastal Wetlands	9.1.8.23

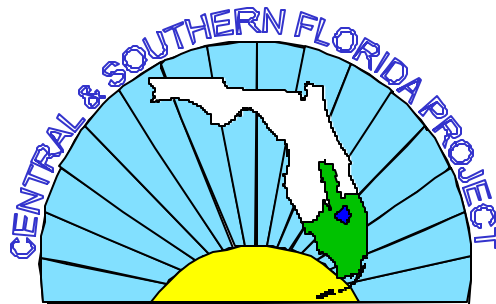
Project Title	Comp. Plan Section
C-111N Spreader Canal	9.1.8.26
Southern Golden Gate Estates Restoration	9.1.9.1
Florida Keys Tidal Restoration	9.1.10.1
Lake Okeechobee Regulation Schedule	9.2.1.1
Environmental Water Supply Deliveries to the Caloosahatchee Estuary	9.2.2.1
Environmental Water Supply Deliveries to St. Lucie Estuary	9.2.3.1
Everglades Rain-Driven Operations	9.2.4.1
Modified Holey Land Wildlife Management Area Operation Plan	9.2.4.2
Modified Rotenberger Wildlife Management Area Operation Plan	9.2.4.3
Change Coastal Wellfield Operations	9.2.5.1
Lower East Coast Utility Water Conservation	9.2.5.2
Operational Modification to Southern Portion of L-31N and C-111	9.2.5.3
Lake Okcechobee Aquifer Storage and Recovery Pilot Project	9.3.1
Caloosahatchee River (C-43) Basin Aquifer Storage & Recovery Pilot Project	9.3.2
Site 1 Impoundment and Aquifer Storage and Recovery Pilot Project	9.3.3
In-Ground Reservoir Technology Pilot Project	9.3.4
L-31N Seepage Management Pilot Project	9.3.5
Reuse Technology Pilot Project	9.3.6

February 26, 2002

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# CENTRAL AND SOUTHERN FLORIDA PROJECT

## COMPREHENSIVE EVERGLADES RESTORATION PLAN



COMPREHENSIVE EVERGLADES  
RESTORATION PLAN

## PROGRAM MANAGEMENT PLAN Data Management



U.S. Army Corps of Engineers  
Jacksonville District



South Florida  
Water Management District



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## LIST OF ACRONYMS

CADD	Computer Aided Design and Drafting
CERP	Comprehensive Everglades Restoration Plan
CIMS	Corporate Information Management System
CROGEE	Committee on the Restoration of the Greater Everglades Ecosystem
CRG	Corporate Review Group
DCT	Design Coordination Team
DDR	Detailed Design Report
DEP	Department of Environmental Protection
DOD	Department of Defense
DOQ	Digital Orthophoto Quadrangles
EMPACT	Environmental Monitoring for Public Access and Community Tracking
FGDC	Federal Geographic Data Committee
GIS	Geographic Information System
IT	Information Technology
ITR	Independent Technical Review
MIS	Management Information System
NGVD29	National Geodetic Vertical Datum of 1929
NAVD88	North American Vertical Datum of 1988
NAD27	North American Datum of 1927
NAD83	North American Datum of 1983
NGS	National Geodetic Survey
NOAA	National Oceanic and Atmospheric Administration
NSDI	National Spatial Data Infrastructure
NSRS	National Standards Reference System
PDF	Portable Document Format
PDT	Project Delivery Team
PIR	Project Implementation Report
PM	Project Manager
PMP	Project Management Plan
PRB	Project Review Board
QA/QC	Quality Assurance and Quality Control
RECOVER	Restoration, Coordination, and Verification
SAJ	Jacksonville District, US Army Corps of Engineers
SDSFIE	Spatial Data Standards for Facilities, Infrastructure, and Environment
SEEJ	Socio-economic and Environmental Justice
SFWMD	South Florida Water Management District
USGS	United States Geological Survey
USACE	United States Army Corps of Engineers
WS01	World Standard 2001
WWW	World Wide Web

## **LIST OF DEFINITIONS**

A/E/C CADD Standards – Architecture/Engineering/Construction CADD drawing standards

Cadastral Data - data defined as the geographic extent of the past, current, and future rights and interests in real property including the spatial information necessary to describe that geographic extent. The Federal Geographic Data Committee approved the Cadastral Data Content Standard (FGDC-STD-003) in April 1999.

CERP Zone – The shared information network constructed to support the CERP under the guidance of CERP Program Controls.

Clearinghouse – An active, online repository, providing data, metadata, and procedures to assist in the implementation of a distributed discovery mechanism for CERP spatial data. All files are cataloged in accordance with FGDC standards and made available in widely used data formats.

GIS – A geographic information system is an organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze and display all forms of geographically referenced information.

Hydrography – Those parts of a map collectively, that represent surface water.

Interoperable – When applied to two or more datasets, this means that there is sufficient commensurability in terms of coordinate systems, units, attributes, spatial and temporal scale and resolution that the datasets can be combined or compared and used together in analysis and presentation.

Metadata – or "data about data" describe the content, quality, condition, and other characteristics of data. The Federal Geographic Data Committee approved the Content Standard for Digital Geospatial Metadata (FGDC-STD-001-1998) in June 1998.

Quality checked – When applied to a dataset this means that a statistical or other numerical assessment of accuracy has been applied based on an independent sample the data space, and further that this assessment is fully documented in the metadata for that dataset.

Spatial Data – Information about the location and shape of, and relationships among, geographic features, usually stored as coordinates and topology.

Spatial Data Standards for Facilities, Infrastructure and Environment – a set of related tables and uniform data structure, geometry and symbology for GIS data. All new GIS databases created by USACE organizations are required to be in this format. This format provides compliance to any finalized FGDC content standards.

## ACKNOWLEDGEMENTS

This effort could only have been completed with the patience, generous time, and participation of the PDT, process managers, resource managers, and the end-users. This was truly a collaborative effort between members from the USCAE and SFWMD. Thanks is owed to everyone who endured the long meetings, exhausting travel, late night phone calls and email, which were necessary to complete this document. We have attempted to capture everyone's dedication and hard work in this final product, which they can take great pride in, as we undertake this monumental task. This effort would not have been attempted without the dedicated patience and persistence of Nadine McAndrews, SFWMD, in assisting with facilities arrangements, last minute travel reservations, and administrative assistance.

In addition to the regular data team members, a very special thanks belong to the facilitators who assisted in gathering this information and keeping our meetings focused, Susan Mason, SFWMD, Ed Terczak, SFWMD, and Allyn Childress, SFERTF. And last but not least, KEMA Consulting who assisted us in the final phase of information gathering and assisting in refining our conclusions.

## **1.0 Program Information**

### **1.1 Description**

The Comprehensive Everglades Restoration Plan (CERP) is a program of interrelated environmental restoration projects sponsored by the Jacksonville District, United States Army Corps of Engineers (SAJ), the South Florida Water Management District (SFWMD), and other state agencies. The program is a multiyear, multibillion-dollar effort to restore the Everglades to a more naturally functioning ecosystem. Implementation of the CERP and management of the associated data will require a joint effort by all agencies for the life of the project. Activities to plan, design, construct, operate, monitor, and evaluate the success of this program will incorporate data from multiple federal, state, tribal, local agencies and other sources.

The purpose of the CERP Data Management Plan is to provide coordinated management and integration of all CERP data based on a program-level strategy. To support the immediate goals of environmental restoration, spatial data standards have been identified and adopted by the Program Delivery Team (PDT) in Phase I (PMP). These standards are contained within the body of the plan and will be implemented in Phase II (Short Term Needs). Other components of the plan that will be implemented in Phase II are the Enterprise Geographic Information System (eGIS) and Common Spatial Framework. Other data standards will be identified, reviewed, and alternatives developed for consideration in Phase II (Short Term Needs).

Numerous types of data and information systems are mentioned in this plan with overlap of varying data types. Because there is overlap of data and data types, the same data may be classified differently by organizations. Evidence of this can be seen in the results from an early effort to gather data requirements for CERP. Topographic data has been classified as “environmental data” by one group while another group considers it to be “operations data” and yet another classified it as “modeling data”. For the purposes of data management and standards, ownership claims and types of data are subservient to the agreed upon standards in this plan.

This plan does not address the specific methods of managing all data. During Phase II, specific Information Technology (IT) alternatives will be scoped, screened, estimated, and recommended solutions will be presented to the appropriate decision making bodies. The selected information technology alternative will be implemented in Phase III (Long Term Needs) of this plan. Phase IV (Full Implementation) and Phase V (Update and Maintain) requirements will not be known until the Phase II analysis is completed. The current data management plan for the short-term is described in the scope of work (Section 2.1.1). This plan will remain in effect until this PMP is updated.

CERP is distinguished from previous project-oriented work in that it consists of numerous linked and dependent projects, whose success or failure will be determined by the response of the system as a whole. RECOVER will use data generated by individual projects and other sources to evaluate restoration success. RECOVER input to this plan is in Paragraph 10.0 (RECOVER Integration).

This program management plan is a “living document” that will change over time. The purpose of this Program Management Plan (PMP) is to provide a program-level implementation strategy for all phases of this project. This plan is not intended to be all-inclusive nor to anticipate or include all possible changes to this program during the lifecycle of its development.

## **1.2 Authority**

(a) Design Agreement between the Department of the Army and the South Florida Water Management District (SFWMD) for portions of the Comprehensive Everglades Restoration Plan (Design Agreement) executed March 12, 2000.

(b) Federal Authority contained in the Water Resources Development Acts of 1992 and 1996 (Restudy), resulting in the Comprehensive Everglades Restoration Plan (CERP) as required by Section 528, Water Resources Development Act of 2000 (WRDA 2000).

(c) Master Program Management Plan (MPMP) between the Jacksonville District of the Army Corps of Engineers (SAJ) and the South Florida Water Management District (SFWMD), executed August 24, 2000.

(d) Program Controls Management Plan (PMP) between the Jacksonville District of the Army Corps of Engineers (SAJ) and the South Florida Water Management District (SFWMD), executed February 5, 2001.

(e) Geodetic Vertical Control Surveys Program Management Plan (PMP) between the Jacksonville District of the Army Corps of Engineer (SAJ) and the South Florida Water Management District (SFWMD), executed February 19, 2001.

(f) Prior executive authorization for an early start of a limited scope short-term needs dated October 22, 2001 is in Paragraph 15.

## **1.3 Background**

The CERP MPMP calls for the creation of a shared data network. The MPMP directed implementation of these activities under the guidance of the Program Controls Management Plan. Responsibility for the management of geospatial data, real estate data and general programmatic data management was removed from the Program Controls Plan (November 2000) because it did not fall within the adopted scope of “Program Controls.” The Design Coordination Team (DCT) recommended the creation of a Program Management Plan for CERP Data Management. The Corporate Review Group (CRG) and the Project Review Board (PRB) approved this concept in December 2000.

Project Managers (PMs) were identified by the SAJ and SFWMD in December. Project Delivery Team (PDT) members were identified in January. Preparation of the Data Management PMP began February 9, 2001.

## 1.4 Related Projects

All programs and projects have data requirements. Management of the data generated by these programs and projects will be accomplished by adherence to standards and making all data available to users, stakeholders and the public.

Integration of existing business systems to support CERP will be evaluated in phase II implementation of this plan.

Project scheduling, document management, performance reporting, shared information network, financial management, cost estimating and forecasting, budgeting, and human resources have data components but are not part of this document.

## 1.5. Differences from the Comprehensive Plan

The Comprehensive Plan does not specifically require data management or standards. The plan requires that performance measures for ecosystems response to change be developed and monitored. To accomplish the purpose of the plan, common data standards and an IT infrastructure needs to be in place to execute the plan.

## 2.0 Program Scope

The scope of this program plan is to provide for a program-wide phased approach to management and acquisition of data. Included in this scope are activities to identify, standardize, organize, document, serve and preserve program data.

- ***Identify*** and maintain an inventory of CERP program and project data requirements. This will involve consultation with the CERP community (formal and informal). The data requirements will be gathered into an information database accompanied by an inventory of current data assets. From this a list of information technology alternatives will be assembled.
- ***Standardize*** all CERP data. A central aspect of CERP is the provision for system-wide assessment and regional evaluation. This will only be possible if data collected and used by component projects is standardized so it can be assembled into larger regional data sets. While this is true of all CERP data, it is especially true of data with a spatial component. System-wide assessment and regional evaluation are essentially spatial analyses. This requires that data used in these analyses be spatially referenced and that all spatial references adhere to an adopted common spatial framework. Tabular attributes of this data must also be standardized.
- ***Organize*** the data to maximize its utility and availability for the CERP Program as a whole and facilitate its discovery and use by all data customers. An online data catalog should be provided as a primary component of this effort. CERP data management will coordinate the design, construction and maintenance of an



information technology infrastructure to house and serve CERP data and data applications.

- ***Document*** all the collected and organized datasets according to FGDC standards. There are formal methods prescribed for doing this with spatially referenced digital data, and use of these methods is mandated. A clearly defined responsibility for documentation is necessary to ensure these requirements are successfully implemented.
- ***Serve*** CERP data users, the public and other agencies by providing for review and transfer of CERP data in response to requests. Make data and its documentation accessible online wherever appropriate.
- ***Preserve*** CERP data for use in disaster recovery and by future projects and studies through short-term backup and long-term archival of CERP data. This is necessary to ensure that CERP data is preserved for use both in disaster recovery and by future projects and studies.

## **2.1 Current Data Management Requirements**

- **Applicability** – The standards and protocols in this plan are applicable to all PDT's and program level activities.
- CERP data will be managed in the CERP Zone.
- Spatial data will conform to the standards set forth in this plan. The collecting agency will furnish all files and metadata to the designated Data Manager on CD or other media. The designated Data Managers are shown in Table 1.
- Undocumented data will not be placed in the CERP Zone.
- Points-of-Contact for various data requirements are shown in Table 1. These individuals know the standards and applicability requirements. Check with these individuals before you collect data.

## **2.2 Goals and Objectives**

The goals of data management are to (1) identify standards and requirements that apply to all data-collection activities and data use (2) leverage corporate assets to avoid duplication of effort (3) document data (metadata) (4) safeguard data and make information available to managers, team members, stakeholders and the public through an integrated infrastructure that can communicate information appropriately.

## **2.3 Program Constraints and Assumptions**

(a) Data will be exchanged through a network of servers and appropriate media in various locations and managed in the CERP Zone.

(b) The data needs addressed by this plan are limited to CERP requirements.

(c) Management plans and their revisions will include a data-management section identifying data requirements (Storage requirements, file size, access requirements, location of individuals needing access, review requirements, types of files, and when data needs to be in CERP Zone) and budgets for data acquisition. These requirements will be identified in project/program PMPs and will be utilized to develop information technology solution alternatives.

(f) The duration of the CERP data management programmatic activity will be the life of the program.

(g) Leverage federal and state assets by including the Corps of Engineers Research and Development Center (ERDC), other Corps districts, federal agencies, state agencies and universities in the process, where applicable.

(h) Federal and state laws governing Information Technology.

## **3.0 Work Breakdown Structure**

The purpose of the (WBS) is to identify the products and sub-products that are required to complete the project as defined in the project Scope of Work (SOW) (Paragraph 2.0). The WBS is as follows is in Table 2.

### **3.1. Product Identification**

The following five subsections define the program phases and describe the major WBS elements to be executed within each phase. Each major WBS element will be completed as proposed in the SOW following initiation of each associated program phase. The products and sub-products are as follows:

#### **3.1.1. Phase I - Preparation of the PMP**

Products and sub-products associated with Phase I are as follows:

- PMP
  - GIS Standards
  - CADD Standards
  - Surveying Standards
  - Common Spatial Framework Plan

- Metadata Standards
- KEMA Report

### **3.1.2 Phase II: Short-term Needs**

Phase II products are as follows:

- Data Management Organization Plan
- CERP Data Clearinghouse
- Data Inventory Report
- Data Requirements Documentation
- eGIS Implementation Plan
  - eGIS System
- CADD Implementation Plan
- Updated Common Spatial Framework Work Plan
- Support Data Implementation Plan
- Information Technology Plan
  - Long-term Backup and Recovery Plan
- Long-term Implementation Plan

### **3.1.3. Phase III - Long-term Needs**

Phase III plan products and sub-products are dependant on the selected IT alternative in Phase II.

### **3.1.4 Phase IV - Full Implementation**

Phase IV plan products and sub-products are dependent on the selected IT alternative in Phase II.

### **3.1.5 Phase V Update and Maintain**

Phase IV plan products and sub-products are dependent on the selected IT alternative in Phase II.

## **4.0 Organizational Breakdown Structure (OBS) and Responsibility Assignment Matrix (RAM)**

The OBS identifies the agency responsible for performing work required for project implementation. The OBS is as follows:

CESAJ-DR-P	Project Manager
CESAJ-CT-C	Construction/A-E Contracting Branch
CESAJ-EN-DT	Survey Section/Design Branch
CESAJ-EN-T	Technical Services Branch
CESAJ-IM-I	Information Management/Implementation Branch
ERDAC	Engineering Research and Development Center

SFWMD  
USGS

South Florida Water Management District  
United States Geological Survey

Product & Sub-Products	DR-P	EN-DT	IM-I	USGS	SFWMD	ERDAC	EN-T
<b>Project Management Plan (PMP)</b>	<b>X</b>				<b>X</b>		
GIS Standards Document			<b>X</b>				
CADD Standards Document							<b>X</b>
Survey Standards Document		<b>X</b>					
Common Spatial Framework Plan		<b>X</b>					
Metadata Standards Document			<b>X</b>				
Kema Report					<b>X</b>		
<b>Data Management Org. Plan</b>					<b>X</b>		
<b>Data Clearinghouse</b>			<b>X</b>				
<b>Data Inventory Report</b>					<b>X</b>		
<b>Data Requirements Documentation</b>					<b>X</b>		
<b>Enterprise GIS Plan</b>		<b>X</b>			<b>X</b>		
SAJ Geodatabase			<b>X</b>				
SFWMD Geodatabase					<b>X</b>		
CERP Geodatabase					<b>X</b>		
Land-use/Cover SOW					<b>X</b>		
1:2400 Base Mapping SOW					<b>X</b>		
1:24000 Base Mapping SOW					<b>X</b>		
Florida Gazetteer				<b>X</b>			
SDE/Oracle Spatial Test Report						<b>X</b>	
<b>Common Spatial Framework Plan</b>		<b>X</b>		<b>X</b>			
SAJ Conversion Work Plan		<b>X</b>					
SFWMD Conversion Work Plan					<b>X</b>		
Survey Report Structures					<b>X</b>		
Survey Report Gauges		<b>X</b>					
<b>CADD Implementation Plan</b>							<b>X</b>
<b>Support Data Implementation Plan</b>					<b>X</b>		
<b>Information Technology Plan</b>					<b>X</b>		
<b>Long-Term Implementation Plan</b>					<b>X</b>		

The RAM is defined as the intersection of the WBS and OBS and is as follows:

## **5.0 Change Control Procedures**

The CERP Data Management PMP will be updated annually and submitted to the DCT for review or when significant schedule or cost changes warrant the update to ensure the selected strategy, technology, schedule and estimated costs are accurate and applicable. Implementation Plans for CERP data management projects will be updated annually, or when significant schedule or cost changes warrant the update. Updates are scheduled for decision points (milestones) for components of the plan.

## **6.0. Program Schedule Development**

The program schedule was developed with the input of PDT members. The program schedule consists of detailed task information for the Phases I and II. All tasks associated with Phases III, IV, and V are unknown at this time. The schedule is in Table 3.

## **7.0. Program Cost Estimating:**

1. Cost estimates are based on \$150,000 per year for FTEs and contractors. If actual costs are known that is what has been used in the estimate.
2. SAJ staff costs, which can be directly identified to CERP, are captured and charged as a direct cost based on effective rates that include direct and indirect costs. Other indirect costs, such as indirect IT staff support at the SFWMD, are accounted for under the indirect cost proportioned to each direct cost at the effective rate set forth by CERP.
3. Costs do not contain any estimates for model conversions and changes to the operations system at SFWMD.
4. Cost estimates do not include costs to migrate data out of existing systems.
5. Costs for “data inventory” at SFWMD and SAJ are for identifying, and locating existing data owned by each organization.
6. The estimate assumes that all resources necessary to perform the tasks will be available on the dates outlined in the schedule and that there are no schedule slips.
8. Costs for later phases of the program will be updated in Phase II.

## **8.0 Funding Requirements**

The funding requirement for Phases I, II, and III is estimated at \$8.6M.

## **8.1 Procurement Strategy**

The laws and regulations of the agency initiating the procurement will be applicable to that particular action. The following procurement actions have been identified:

- |                                     |           |
|-------------------------------------|-----------|
| a.) SAJ A-E Contracting for Surveys | \$760,000 |
| b.) SFWMD Contracting for Surveys   | \$300,000 |

Information technology services will be procured on an as-needed basis by each agency.

## **9.0 Data Management Implementation Strategy**

Implementation of the CERP Data Management PMP will occur incrementally. The identified short-term goals will be implemented first. These are the activities necessary to support the later phases of data management and related projects already underway. These short-term goals focus on establishing the basic infrastructure and tools for data management, including the common data repository and the standards required to make it operational. Specific activities associated with this effort are:

- early establishment of eGIS with base map data and controlled vocabulary
- establishment of NAVD88 marks on key structures and gauges
- a user needs assessment to establish priorities
- establishment of a CERP Data Clearinghouse and Data Oversight Committee and;
- a program to bring key existing datasets into the Common Spatial Framework

### **9.1 General Data Standards**

CERP data standards will be consistent with existing federal and state requirements for data collection, storage and documentation. The data standards that were selected were standards published by recognized standards bodies; standards that are well established and in widespread use and standards that confer the greatest degree of interoperability among applications and agencies. The list of selected standards is shown in Table 4. These standards do not exist in a vacuum. Check with the POC listed in Table 1 for applicability of any particular standard listed in the table.

### **9.2 Data Collection Standards (Surveying, Cadastral, and Remote Sensing).**

Spatial data collection standards will be effective upon approval of this plan. The Jacksonville District Chief of Survey and an authorized South Florida Water Management District Licensed Surveyor will approve all Statements of Work prior to the work being performed. All work will be done under the direction of a Florida Licensed Surveyor and Mapper. Remote sensing scopes of work and other requirements associated with remote sensing shall be coordinated with the POC listed in Table 1.

The MPMP, (Volume I, Paragraph 4.7, p. 53 and Appendix D, Paragraph 4.7) requires that “The surveying and mapping information in the engineering appendix to the Project Implementation Report (PIR) be sufficiently detailed to support the development of project real estate requirements and preparation of the Design Documentation Report and Plans and Specifications.” The applicable standards to accomplish the stated requirements are as follows:

#### **9.2.1 Control**

All surveys or data collections, regardless of type and who procures the service, shall be referenced to 1<sup>st</sup> and 2<sup>nd</sup> Order Monuments in the National Spatial Reference System

(NSRS) maintained by the National Geodetic Survey (NGS). The CERP Network (Geodetic Vertical Control Surveys) will be published by NGS in March 2003. After publication of this information all surveys must be referenced to these marks. Prior to March 2003, all surveys shall be referenced to existing 1<sup>st</sup> and 2<sup>nd</sup> Order Monuments with multiple datums. Check with the surveying POC in Table 1 for which monuments to use prior to initiating any surveying work.

### **9.2.2 Datums**

Horizontal Datum: North American Datum of 1983 Vertical Datum: North American Vertical Datum of 1988 (NAVD 88). All new collections will be in the above vertical and horizontal datum, with sufficient ties to previously used datum (North American Datum – NAD 27 and National Geodetic Vertical Datum of 1929; NGVD 1929) to allow for incorporation of older data.

### **9.2.3 Projections**

Florida State Plane Coordinate System, Florida East or West Zone.

### **9.2.4 Units**

U.S. Survey feet

### **9.2.5 Applicable Standards**

U.S. Army Corps of Engineers Surveying/Mapping Engineering Manuals

- EM-1110-1-1000 Photogrammetric Mapping
- EM-1110-1-1002 Survey Markers and Monuments
- EM-1110-1-1003 NAVSTAR Global Positioning System Surveying
- EM-1110-1-1004 Deformation Monitoring and Control Surveying
- EM-1110-2-1003 Hydrographic Surveying
- EM-1110-2-2909 Geospatial Data and System
- EP-110-1-6a&6b Sign Standards Manual

In addition to the above listed manuals, the following are also applicable:

- Spatial Data Standards for Facilities, Infrastructure and Environment
- FGDC-STD-009-1999 Content Standard for Remote Sensing Swath Data
- FGDC-STD-008-1999 Content Standard for Digital Orthoimagery
- Chapter 472, all other Florida Property and Boundary Surveying Statutes, and code or statutes relating to remote sensing and photogrammetry.
- Florida Minimal Technical Standards for Surveying and Mapping Accuracy, 61G17-6 Florida Administrative Code (FAC)
- FGDC-STD-007.3-1999 The National Standard for Spatial Data Accuracy

Documentation of data collections shall comply with the following:

- FGDC-STD-001-1998 Content Standard for Digital Geospatial Metadata (v2.0)
- FGDC-STD-001.1-1999 CSGDM, Part 1: Biological Profile

- Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing

#### **9.2.6 Pre-Collection Requirements**

Prior to the procurement by contract or acquisition of spatial data by in-house staff and other government agencies, all PDTs, program-level teams and others will check for the availability of suitable data through the National Spatial Data Infrastructure (NSDI) and Florida Data Dictionary. Executive Order 12906 requires all federal agencies to search for data prior to collection to avoid duplication of effort and wasting of scarce resources. Data from federal, state, local, private and international sources can be located on these servers. The USACE implementation of EO 12906, ER 1110-1-8156 requires each District Engineer to certify to Congress each year that no spatial data is being collected without first searching the Clearinghouse, and that all data collected is represented by metadata posted to the USACE NSDI node.

Access to these sites is by Web browser at the following URLs:

<http://fgdc.er.usgs.gov/clearinghouse/clearinghouse.html>

<http://corpsgeol.usace.army.mil/>

#### **9.2.7 Suggested Procurement Language**

Table 6 contains suggested procurement language for spatial data. Check with your contracting and legal staff prior to using this language in your contract.

### **9.3 CERP Data Clearinghouse**

A CERP Data Clearinghouse will be created containing a browser- accessible metadata repository. This clearinghouse will serve as the primary source for identifying both the availability of data and ongoing data acquisition activities and will link to the National Spatial Data Infrastructure (NSDI) Clearinghouses. The Clearinghouse will be completed in Phase II.

### **9.4 CERP Data Oversight Committee.**

The CERP Data Oversight Committee will be comprised of technical data leads in the fields of surveying, mapping, GIS, remote sensing, geology, environmental, engineering, economics, biology, socioeconomics and other disciplines. The CERP Data Oversight Committee will provide technical assistance related to all aspects of data acquisition, maintenance, access and use. This will provide a mechanism for: (1) review and comment on all data- related technical specifications (2) ensuring that a proper QA/QC process will be in place, particularly for data-acquisition contracts (3) review of contract SOWs before they are issued. It is the responsibility of the individual requestors to provide funding for review. The members of this committee are in **Table 1**.



## 9.5 Enterprise Geographic Information System (eGIS)

Geographic Information Systems (GIS) are the hardware, software, standards, protocols and formats used to automate, store, update, manipulate, analyze and display geographically referenced information. Such information consists of two linked components. The spatial component indicates the location, shape of and relationships among features. The tabular component describes the feature's attributes. Examples are vegetation type, road class, and water depth or phosphorus concentration.

CERP projects will use GIS for decision support, analysis and mapping. Though all agencies involved in CERP have made significant investments in the development of GIS programs, the standards for both spatial referencing and attribution used by each agency differ to varying degrees. Effective GIS support for CERP will require that new and existing data be brought together with a common spatial reference framework and standardized attribute schemae.

The eGIS will consist of a central repository for data with a spatial component that is used by multiple projects, business units or agencies within CERP, and the process and support infrastructure for processing, storing and distributing that data to the widest possible audience. An eGIS depends on adherence to agreed-upon standards that allow data collections by disparate projects to be used together and by others. Benefits accrue from the enhanced ability to reuse collections, combine sub-regional data sets into larger regional datasets and eliminate redundant collections and process steps.

The eGIS data component will establish a CERP GIS Data Acquisition and Management Program that will insure that data will be developed as a CERP corporate resource and managed as a capital asset. The CERP GIS Data Acquisition and Management Program will specifically address: (1) assignment of Data Administrator and Data Steward roles and responsibilities for GIS data (2) a GIS Data Inventory and Needs Assessment (3) development of a GIS Data Acquisition Plan, with detailed technical specifications and associated cost estimates (4) development of a Data Clearinghouse as a node on the National Spatial Data Infrastructure (NSDI) (5) implementation of a Florida Gazetteer and Thesaurus (6) implementation of a GIS data repository for CERP GIS Data (7) implementation of GIS data documentation standards (8) implementation of GIS data collection and mapping standards (9) implementation of a GIS Data QA/QC Program and (10) implementation of a GIS Data Maintenance Program.

### 9.5.1. GIS Standards

SAJ and SFWMD have adopted the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE). A specific plan that contains a table structure and other detailed information is under development at SAJ and SFWMD. All of this information will be in the Implementation Plan schedule for completion at the end of FY-02. For interim information and standards applicability, contact the GIS POC shown in **Table 1**.

## 9.5 CADD Standards

All work done in conjunction with the CERP will use the Tri-Service A/E/C CADD Standards Release 2.0 (CADD Standards) and the Spatial Data Standards for Facilities, Infrastructure, and Environment Release 2.0 (SDSFIE) or later. This is in accordance with the Master Project Management Plan (MPMP) Volume 1, Paragraph 4.7, P. 53. The current CADD standards are in **Table 5** of this document.

The purpose for the standards and benefits that accrue from adopting the standards are as follows:

- Migrating drawings from one CADD package to another presents a number of challenges. These include line code and color problems, font issues, and line weight problems. If existing CADD drawings conform to a consistent standard then a batch translation is a likely vehicle to facilitate this translation. This is essential when moving data from one platform to another, for example from MicroStation to ArcGIS. If a CADD drawing does not follow a standard then bringing that data into a GIS can be very problematic.
- Requiring all CERP data procurement comply with common A/E/C CADD Standards Release 2.0 will ensure the data is in compliance and consistent data can be easily shared among all CERP data users.

The CADD Standards may be downloaded from the Internet at: <http://tsc.wes.army.mil>

To ensure consistency with CERP CADD files the following guidelines and definitions better define the use of the available options within the A/E/C CADD Standards:

- Level/layer naming will be in conformance with the ISO format for layer/level naming as discussed in chapter 4 of the standards.
- The CADD Standards address a file naming convention for cadd drawings for both model and sheet files. The optional 20 character Project Code addressed in the CADD Standards will be used by each entity creating CADD data for the CERP. This will allow the user to adapt their current system of managing files to be compatible with CERP CADD data.
- At time of “publication” of each sheet file from CADD, the document shall be in conformance with the CERP Document Filing Codes. “Publication” being when the finished CADD file is sent to a hardcopy device or into another electronic format such as pdf.
- Sheet sizes for CADD drawings shall be as called for in the contract for design services.
- If an entity (element) to be drawn in a CERP CADD file is not located in the CADD Standards, the user is directed to check the SDSFIE. If the entity is not found then the user is directed to contact the CADD manager POC’s for resolution.
- If an entity (element) is to be drawn and is located in both the CADD and SDS with conflicting attributes (color, style, weight), the first priority is the CADD standards.
- Points of Contact (POC’s) included in **Table 1**.

- The CADD Manager for the Jacksonville District Corps of Engineers and the South Florida Water Management District CERP CADD Manager are the Points of Contract (POC's) for any questions arising in conjunction with implementing these instructions. Any problems encountered with the CADD Standards, such as no layer/level assignments for an entity to be drawn, will be documented and referred to the POC's for resolution. The POC's will make a determination and post the resolution to the originator as well as on the CERP web site.
- A Procedures Manual is being developed to assist users in achieving the objectives of these standards. This manual will allow the reader to understand and resolve the "How do I ... " questions that come up in the day-to-day operation of cadd work as it pertains to the CERP. When completed the manual will be posted to the CERP web site. Instruction on how to request corrections or make additions to the manual will also be found on the web site.

## **9.7 Common Spatial Data Framework.**

The SFWMD and SAJ have agreed to use a common spatial data framework for this program. This makes it necessary to reference all spatial data collected for component projects to a common reference frame (NAD 83 Horizontal and NAVD 1988 Vertical). To facilitate the use of a common spatial data reference, the Geodetic Vertical Control Surveys Project was initiated in FY01. This effort has been accelerated and, when completed in FY03, will result in a major densification of first- and second-order vertical control throughout South Florida. This is being done in cooperation with the National Geodetic Survey (NGS) and, once adjusted, will become part of the National Spatial Reference System (NSRS). Whenever NSRS is mentioned below, it is understood to include this new network. Cost savings will accrue throughout the duration of CERP for two primary reasons. First, properly acquired GPS heights will replace traditional leveling in many cases. Second, the NSRS will be adjusted by NOAA/NGS whenever they change the supported national vertical datum. The first expected change to the supported national vertical datum will occur in 2003, and several such changes will take place throughout the duration of CERP. As long as all control is tied to the NSRS, these adjustments will not seriously impact CERP.

### **9.7.1 Migration Plan**

The Central and Southern Florida Project (C&SF), C&SF Comprehensive Restudy, gauging stations, monitoring stations, trigger wells, regulation schedules and other project components referenced to NGVD 29. Current regulation and operation schedules, minimum flows and levels, hydrologic modeling and performance measures are based on the old NGVD 29 vertical datum. The conversion plan for migrating elevations from NGVD 1929 to NAVD 1988 is as follows:

### 9.7.2 Background

Billions of Federal and State taxpayer dollars will be invested into the Comprehensive Everglades Restoration Project. The foundation of all engineering/scientific analysis and subsequent construction activities rests in the accuracy of the survey data and how well that data correlates across the entire project area.

Inconsistencies, within the elevation data, across the region exist and could lead to erroneous results if not corrected. Historically, work in the project region was based on the vertical datum NGVD 29.

*From Technical Letter No. 1110-1-152*

(Engineering and Design CONVERSION TO THE NORTH AMERICAN VERTICAL DATUM OF 1988, 1 January 1994)

“NGVD 29 has been replaced by NAVD88...NAVD88 was established to resolve problems and discrepancies in NGVD29...”

“...NGVD 29 was established by constraining...first order leveling nets to conform to Mean Sea Level (MSL)...”

NGVD 29 was based on the assumption that local MSL at the defining tidal stations equaled 0.0000 foot on NGVD 29. Measurements over a period of time have shown that this assumption is not necessarily valid and MSL varies from station to station.

“Since NGVD 29 was established, it has become obvious that the geoid based upon local mean tidal observations would change with each measurement cycle.”

Estimating the geoid based upon the constantly changing tides does not provide the most stable estimate of the shape of the geoid, or the basic shape of the Earth.

The datum for NAVD 88 is based upon the mass or density of the Earth instead of the varying heights of the seas...

It should be noted that the NAVD 88 heights are better estimates of orthometric heights than the NGVD 29 heights. Better estimates of orthometric heights will become more critical in the future as surveying techniques continue to become more sophisticated and more accurate. The improved accuracy of geoid height determinations using GPS data requires the best estimate of true orthometric heights...

The datum definition [NAVD88] is the most scientifically acceptable of all the definitions considered and is the most natural because it is based on an undisturbed representation of the Earth's gravity field. It is the most suitable for

the geoid height computations needed for the reduction of GPS ellipsoidal heights...

“For a period of time, NGS will support both the NAVD88 and the NGVD29. Beyond the next 5-7 years [1999-2001], continued maintenance of NGVD29 will depend on user demands and budget constraints...”

***Inconsistencies within NGVD29 became more pronounced over time due to physical factors as well as better measuring techniques and equipment. Large area projects are at risk to these discrepancies much more than local area project sites.***

The letter further delineates the technical advantages for USACE in converting to NAVD88, including better data and the fact that future surveys performed for the Federal government will require use of NAVD 88.

### **9.7.3 Migrating from NGVD 29 to NAVD88**

Steps for moving from the National Geodetic Vertical Datum of 1929 (NGVD 29) to the North American Vertical Datum of 1988 (NAVD 88):

- 1) NEW PROJECTS. All newly established projects that do not require any ties to NGVD 29 will be established in NAVD 88 only.
- 2) CONTINUING PROJECTS. All requested surveys for continuing projects that are currently in NGVD 29 will include ties to the NAVD 88 datum sufficient for migrating the project to NAVD 88. The fieldwork required to make these additional ties will be paid for with minimal cost increase to the already funded project. However, the conversion of the historic data will require additional funding should the conversion to NAVD 88 be fully implemented for the project. As the fieldwork necessary to support the conversion will already be in our archives, only re-computation of survey data and conversion of CADD files will need to be funded.
- 3) CERP/C&SF PROJECTS. All CERP related projects will be pro-actively tied to the CERP network and NAVD 88.
  - a) The following projects have been identified as CERP related projects that are underway. These projects will be researched and plans, including estimates for cost and schedule, will be developed to tie these projects to the CERP Network.
    - i) Everglades Construction Project (ECP)
    - ii) Indian River Lagoon Feasibility
    - iii) Water Preserve Areas
    - iv) Lake Okeechobee and Herbert Hoover Dike
    - v) Lake Okeechobee Watershed Project
    - vi) C-51

- vii) C-111 Project
  - viii) Modified Waters to ENP
  - ix) East Coast Canal Structures C-4
  - x) Western C-11
  - xi) Southern Crew
  - xii) Lake Trafford
  - xiii) Seminole Big Cypress
  - xiv) Florida Keys Carrying Capacity
  - xv) Tamiami Trail Culverts
  - xvi) Ten Mile Creek
- b) The following projects are the first 10 authorized CERP projects and will be established in NAVD 88 and the CERP Network.
- i) C-44 Basin Storage Reservoir
  - ii) EAA Storage Reservoir – Phase 1
  - iii) Site 1 Impoundment
  - iv) WCA 3 A/B Levee Seepage Management
  - v) C-11 Impoundment and STA
  - vi) C-9 Impoundment and STA
  - vii) Taylor Creek/Nubbin Slough Storage & Treatment
  - viii) Raise & Bridge Tamiami Trail & Fill Miami Canal
  - ix) North New River Improvements
  - x) C-111 North Spreader Canal
- 4) HISTORIC DATA SETS. Historical data will be converted on an as need basis only. Techniques for “conversion” are listed here in order of priority.
- a) Locate and tie a substantial amount of the original monuments used to control the project utilizing GPS or by running conventional leveling, using NAVD 88 heights, to the monuments and reprocess the data.
  - b) When the original monuments are not available tie to enough of the hard secondary topographic monuments (i.e. bridge abutments etc.) as possible to establish a conversion factor. Then reprocess the data.
  - c) As a last resort, apply the VERTCON conversion based on the newly established South Florida VERTCON adjustment.
- 5) GAGES & STRUCTURES. The South Florida Water Management District has identified 113 gages and 135 modeling structures that need to be tied to the NAVD 88 datum and the CERP Network within the next two years. GPS will be used to tie each gage/structure to a minimum of three CERP monuments in three

different quadrants. Specific occupation times, field procedures, and required vectors will be determined based on each site and subject to the approval of the SAJ Chief of Survey and an authorized Licensed Surveyor of the South Florida Water Management District and will meet the 2-cm ellipsoidal height and 2-cm orthometric height requirements as set forth by NGS. The SFWMD is actively working to tie some of these structures. Survey costs are estimated at \$1,000 per station.

- a) Five (5) gages have been identified as “high priority” and need to be surveyed as soon as possible.
- b) Fifty-five (55) gages have been identified as “phase 1” and should be surveyed in the six-month to one-year time frame.
- c) Fifty-three (53) gages have been identified as “phase 2” and should be surveyed in the one-year to two-year time frame.
- d) The 135 structures identified should be surveyed in the one-year to two-year time frame.

The Jacksonville District Chief of Survey and an authorized South Florida Water Management District Licensed Surveyor will approve all Statements of Work prior to the work being performed. All work will be done under the direction of a Florida Licensed Surveyor and Mapper or a Florida licensed professional aerial photographer/remote sensing specialist.

## **9.8 Information Technology/Information Management Support**

The CERP Zone, as described in the List of Definitions (pg. iv), was procured and built according to the requirements set forth in the CERP Program Controls Program Management Plan. The CERP Zone provides a common physical infrastructure, tools and context within which CERP Data Management can take place. The data and data-related applications required to support CERP are addressed by the provisions of this Data Management Program Management Plan and will further influence development of the CERP Zone.

The success of this plan will rely on adherence to all the defined data standards and maintenance of the data infrastructure. Management oversight, enforcement and coordination will be required to ensure the goals of this plan are met.

The role of the CERP IT Group (Staff and contractors from SAJ IM Division and SFWMD Central IT) will be to design, implement, administer, support and maintain the IT infrastructure required to support all CERP activities. The components that make up the CERP data infrastructure are systems that store, search, retrieve, backup, archive, serve and maintain data. The CERP IT Group will monitor the IT infrastructure designed to support the data to ensure that the needs of CERP projects and programmatic activities are being met and corrective action is taken to prevent impaired performance of the infrastructure.

The CERP IT Group will design, implement and maintain a storage system to ensure efficient management and flexibility to meet the ongoing and future CERP data storage and access needs. Data-storage requirements will be monitored and solutions implemented in a timely manner.

CERP data will be protected from system failure, accidental damage and intrusion. All state and federal guidelines for data management will be observed. Standard procedures will be established and followed to ensure data is archived and the integrity of the CERP project data is preserved against equipment failures and catastrophic failures. Backup and archival procedures, as well as archival media, will be renewed periodically to ensure CERP data remains retrievable in the future.

## **9.9 Support Data Requirements**

Other data types and systems will be identified in Phase II and integrated into this plan where applicable.

## **10.0 Restoration Coordination and Verification (RECOVER) Data**

### **10.1 Environmental Data**

Environmental data includes all measurements generated from surface water and groundwater, hydrologic, meteorological, geological, water quality, and biological monitoring and research. Monitoring networks comprised of thousands of stations sponsored by numerous federal, state and local government agencies and tribal governments are currently operating throughout South Florida and contribute significant volumes of South Florida environmental data. Portions of these existing networks will be integrated into various CERP programs and projects, but new long-term networks and monitoring stations specific to CERP must be established. Additionally, as CERP progresses, there will be a need for a variety of research projects in the areas of ecology, geology, water quality and hydrology. Consequently, there will be a significant increase in the amount of environmental data being collected, and it must be effectively managed to ensure it is useable.

As such, a formally established, integrated system for sharing and managing environmental data and reports among agencies, other participants and interested parties will be essential for CERP. The purpose of such a system will be to organize all monitoring data as a basis for quantifying and qualifying ecosystem responses to the restoration projects and for evaluating the success of the individual projects and the overall restoration effort. CERP data management must provide a holistic and integrated view of all environmental monitoring and research data to ensure the proper definition of relationships among these data, to provide a database structure for efficiently storing and managing these data and to ensure they can be accessed both easily and efficiently as part of the overall centralized CERP shared data and information network infrastructure. This will also facilitate the sharing of biological, physical, and chemical information among



the numerous agencies expected to participate in the CERP monitoring and assessment activities.

Solutions implemented to manage environmental data for CERP will depend largely on the scope of the RECOVER monitoring and assessment plan, as well as monitoring requirements of the various CERP projects. Flexible database architecture will be required to accommodate uncertainty and change and to deliver information in a multitude of formats, depending upon stakeholder needs. As additional needs for environmental data are documented, they will be met through database enhancements following the “build incrementally” philosophy to ensure continued progress.

Environmental data, including monitoring (hydrologic, water quality, geological and biological, etc.), research, and modeling data used to assess the effects of implementing CERP component systems will be required to organize and archive scientific and technical data and reports generated from the system-wide and project-level monitoring and research programs, and will also be part of the overall centralized CERP shared-data and information network infrastructure. Environmental monitoring will be planned, designed, and developed so it is integrated with other database components of the CERP data-management infrastructure.

A well-managed, integrated system provides an opportunity to share information among projects and agencies, allowing for more efficient use of technology and resources. Management of CERP data will be designed and organized to facilitate electronic storage and retrieval of environmental data, as well as other information (modeling, socioeconomic, costs, schedules, etc.) that will be needed, to assess CERP performance and system responses and produce the required reports describing and interpreting those responses.

The system will likely consist of development and production database servers and Web access that will allow a multitude of data types and relevant documents to be easily accessed and shared. The infrastructure and software will be designed to eliminate the potential for security and firewall breaches that could threaten the integrity of the system and the information it contains. The Website will also be used to post information and data for review by other agencies, stakeholder groups and the public.

## **10.2 Standards, Processes, Procedures, and Tools**

Standards and processes specific to environmental data will address such topics as initiating change to the data content of the database, registering and naming monitoring stations, documenting data (metadata), using proper data projections, horizontal/vertical datum, file formats and compression techniques, and establishing appropriate file coding and naming conventions for all data to be stored on the shared data and information network.

### **10.3 Leveraging and Integrating Existing Environmental Data Systems**

Environmental database development efforts have been pursued recently by different state and federal agencies. Among these efforts are the USGS NWIS II initiative, the EPA STORET initiative and the Everglades National Park database initiative. In addition, the SFWMD maintains and enhances a family of distributed environmental and research-related databases and data sets. Among these databases are the corporate environmental database (DBHYDRO), the Kissimmee River Restoration Evaluation Program Database, the Threshold Research database, the Lake Okeechobee Research database and an Operations database that includes Supervisory Control and Data Acquisition (SCADA) System software and hardware used to monitor key environmental parameters in near and real time and effect operational control over the water-control structure network.

Currently under development is the SFWMD Corporate Information Management System (CIMS). This is an ongoing initiative working toward integrating a collection of business systems (regulatory, financial, environmental, real estate, operations, etc.) now existing as distributed business systems throughout the agency. This study, being conducted by the SFWMD and KEMA Consulting, will provide details on specific integration issues and on an overall integration methodology.

A component of the CIMS architecture is the SFWMD Water Management System (WMS). WMS is that portion of the CIMS that pertains to monitoring and controlling the Central and South Florida Flood Control Project and all other remote-data-acquisition and control installations throughout the District. WMS data includes, but is not limited to: water elevations; flow data; meteorology; gate and pump status; and other data primarily used by the SFWMD Operations Control Center and of interest to other District groups and the public.

The SAJ Hydraulics and Hydrology Branch monitors meteorological and hydrologic data with a water management decision support system. The SAJ is migrating to a new corporate system known as the Corps Water Management System (CWMS) modernization, scheduled for deployment to the South Atlantic Division in the fourth quarter of FY02. CWMS is the data acquisition, management, modeling and decision-support system that supports the Corps' water management mission.

Historically, business systems have been developed by individual divisions to manage and support various pieces of environmental data. Much of the environmental-monitoring data necessary for CERP exists in program databases distributed throughout and among different agencies. By providing access to an integrated database system and establishing a common data format, a solution to this complicated mix of information will be provided. Through a simple graphical user interface, users will be able to query the system and easily access and search through multiple databases that support various programs.

A thorough examination and understanding of these databases and data sets and their respective needs, successes and directions must be applied to the management of CERP environmental data. A data-management strategy leveraging these existing systems and organizational expertise must be pursued. The plan will optimize, as much as possible, environmental data assets available to SFWMD and SAJ.

#### **10.4 System Specifications**

To meet the information and management decision needs of environmental managers, a solution will be developed as a database, with geographic information system (GIS) and Web-enabling technologies. Integration of other local, state and federal government databases will be achieved by providing Internet access to all interested government entities. A high priority is to make information from all environmental programs available through the Internet. The proposed solution will provide an environment that gives project managers, modelers, scientists, planners, managers, other agencies and the public access to a dynamic, data-driven interface via Web-based applications that are time and space relevant. Examples are documents, modeling and maintenance tools, project collaboration through industry-standard scheduling software and databases, connectivity to the existing enterprise data systems, and an adequate modeling environment, which will support the necessary communication, reporting and assessment for CERP.

#### **10.5 Quality Assurance/Quality Control**

The RECOVER PDT has determined that environmental data and information developed through this process must: (1) withstand scientific review and legal scrutiny (2) be used to develop scientific and technical consensus among agencies (3) be fully utilized and integrated into the plan. As such, all environmental data will be quality assured via established procedures. Quality assurance plans must be developed and approved for all types of monitoring activities prior to data collection. A quality assessment/quality control process will be established to ensure that data generated from the monitoring and research programs are checked for proper integrity before being archived in the shared database. The data will be made available to all users upon conclusion of the quality assurance process unless otherwise described in the approved PMP for a specific project.

#### **10.6 Maintenance**

Implementation of CERP will be a multiyear process, with continuous maintenance efforts throughout the life of CERP. The designated Data Steward(s) for environmental data will perform long-term care, updating, QA/QC and maintenance. The system will be maintained and expanded to meet the needs of CERP, as necessary, and to accommodate continuous data acquisition, storage and publishing. "Out" years will require maintenance for hardware and software, purchase of additional disk space, and memory and system enhancements, as required.

## **10.7 Datum Conversion**

An overriding concern of the CERP Data Management Plan is the establishment of NAVD88 values on all existing vertical data within the “Common Spatial Framework.” VERTCON is not an acceptable means for a wholesale conversion for data pertaining to hard sites (monitoring stations, structures, gage stations). Physical tie-in to historical NGVD29 data can be achieved to meet the requirements for individual project surface modeling. The establishment of the Common Spatial Framework model will ensure the degree of accuracy required to withstand independent technical review and compliance with federal standards. Retention of historical data along with converted vertical references may have the potential for increasing disk-space requirements. Local and state governments will benefit through increased consistency and accuracy of surface-modeling capabilities. Data conversion must be thoroughly and deliberately planned but also swiftly executed to minimize the duration of time for which modeling is being conducted on potentially conflicting datum.

## **10.8 Modeling Data**

CERP implementation will be supported by a variety of hydrologic and water quality simulation models. Hydrology and hydraulics (H&H) modeling uses very large data sets to conduct mathematical modeling analyses, and represents a significant percentage of the CERP data-storage requirements. These models will be applied over a wide range of spatial and temporal scales, making their data-storage requirements extremely large. Model input sets and results should be migrated to a database architecture in the near future. Input data sets used to support these models must be properly documented and managed within the overall CERP Data Management System. In addition to input data sets, very large output data sets will result from different modeling scenarios. Documentation is also associated with modeling activities and must be available to a number of end-users. A centralized file server will be established to manage the volume of data and meet end-user accessibility needs.

A database-driven approach for creating Web Pages for publishing of hydrologic performance measures and modeling scenario results is currently under development by a Model Refinement Team (MRT). The architecture being designed addresses the issues of archiving modeling scenarios and will result in a secure computing environment that will provide a foundation for future development and growth. Archiving model input, output and source code of the models used in the development of CERP has been identified as a priority by the MRT.

Consistent data must be maintained for modeling purposes, and archival procedures for modeling alternatives (source code, documentation, input/output data, post-processed results and performance measures) must be established. The input and output data sets must be archived to preserve analysis of results upon which significant decisions are based. Peer reviewers external to the SFWMD and SAJ will conduct verification of modeling results. Accordingly, both input and output data sets for selected modeling scenarios must be made accessible to these external participants.

## **11.0 Compliance**

By adopting this plan, all organizations that collect, publish, and utilize spatial and other data for CERP will abide by the standards contained in this document.

Managers are responsible for enforcing compliance with the agreed upon standards and guidelines. Failure to adhere to the agreed upon standards will add time and cost to all projects because non-standard data cannot be exchanged between users and stakeholders without excessive processing delays.

Table 1 contains a preliminary list of the data points of contact for various spatial and non-spatial areas for CERP. These experts shall act as consultants to the CERP projects providing assistance on relevant data issues in their respective field of expertise.

## **12.0 Program Cooperation Agreement**

The PCA is covered under the Design Agreement.

## **13.0 Program Closeout Procedures.**

This effort spans the life of CERP. Close-out procedures have not been determined at this time.

## **14.0 Summary of Work-in-kind Services**

The SFWMD will receive work-in-kind credit for some work performed under the CERP Data Management activity following review by the SAJ. The SFWMD will transmit a letter requesting work-in-kind credit with this management plan to the SAJ. The SFWMD will prepare quarterly reports detailing in-kind work performed under this activity. The SAJ will review the work-in-kind credit reports and provide the SFWMD with a letter indicating approval of in-kind work completed.

## **15.0 List Of Management Plan Preparers**

The following individuals from the U.S. Army Corps of Engineers, Jacksonville District (CESAJ), and the South Florida Water Management District (SFWMD) helped prepare this plan.

### **SFWMD**

Rick Miessau	IT Project Manager	SFWMD-ITD
Brian Turcotte	Lead Engineer	SFWMD-EMA
Linda Lindstrom	Dir. Hydro Info. Systems & Asses.	SFWMD-EMA
Jim Cameron	Supervisor, GIS Projects	SFWMD-ITD
Dr. W. Kenneth Stewart	Chief Consulting Engineer	SFWMD-WRO
Richard Feeman	IT Project Manager	SFWMD-FNA
Dr. Richard March	Staff Economist	SFWMD-WSD
Dr. James Price	Data Architect	SFWMD-Contractor
John Higgins	Sr. Planner	SFWMD-WSD
Eddy Blankenship	Sr. Business Operations Analyst	SFWMD-REEC
Howard Ehmke	Land Surveyor	SFWMD-ERB
Dennis Meierer	Land Surveyor	SFWMD-SER

### **SAJ**

Charles D. Fales	Project Manager	CESAJ-DR-S
Rory Sutton	GIS Manager	CESAJ-IM-I
Deborah A. Solis	Civil Engineer	CESAJ-DR-S
Art Bennett	Web Master	CESAJ-PD-PR
David Robar	Civil Engineer	CESAJ-EN-DT
Karen Pitchford	Geologist	CESAJ-EN-G
Roger Porzig	Civil Engineer	CESAJ-EN-T
Kevin Wittman	Economist	CESAJ-PD-D
Annon Bozeman	Planner	CESAJ-PD-E
Deborah Peterson	Civil Engineer	CESAJ-PD-PN
Rolando Altamarino	Civil Engineer	CESAJ-PD-PN
Gregory Martin	GIS Technician	CESAJ-RE
Peter Kendrick	Design CADD	CESAJ-EN-D

## **16.0 Reference Documents and Forms**

### **Reference Documents**

- USGS Digital Map Data Model, <http://geology.usgs.gov/dm/>
- Communications Standard Dictionary, 2nd ed., Dr. M. Weik
- Finding the Forest in the Trees – The Challenge of Combining Diverse Environmental Data, National Research Council, National Academy Press, 1995
- The National Academy of Sciences, Water Science and Technology Board, Committee on the Restoration of the Greater Everglades Ecosystem (CROGEE), Letter to RECOVER Adaptive Assessment Team, June 25, 2001
- KEMA Consulting, Deliverable from SFWMD Contract C-11942, June 2001
- Corps of Engineers Engineering Regulations, Manuals, and Circulars.
  - <http://www.usace.army.mil/library/directory.html>

## TABLES



**TABLE 1. CERP Data  
Point of Contacts**

Area of Expertise	Agency	Name	Phone	Email
Survey	SFWMD	Howard Ehmke	(561) 682-6672	Hehmke@sfwmd.gov
	SAJ	David J. Robar	(904) 232-1603	David.J.Robar@saj02.usace.army.mil
GIS	SFWMD	James Cameron	(561) 682-6037	Jcameron@sfwmd.gov
	SAJ	Rory Sutton	(904) 232-2743	Rory.J.Sutton@saj02.usace.army.mil
CADD	SFWMD	Howard Ehmke	(561) 682-6672	Hehmke@sfwmd.gov
	SAJ	Roger Porzig	(904) 232-1189	Roger.W.Porzig@saj02.usace.army.mil
Remote Sensing	SFWMD	Ken Chen	(561) 682-6329	Kchen@sfwmd.gov
	SAJ	Dave Robar	(904) 232-1603	David.J.Robar@saj02.usace.army.mil
Project Management	SFWMD	Rick Miessau	(561) 682-6521	Rmiessau@sfwmd.gov
	SAJ	Charles D. Fales	(904) 232-1017	Charles.D.Fales@saj02.usace.army.mil
Data Architect	SFWMD	Dr. James Price	(561) 682-2764	Jprice@sfwmd.gov
	SAJ	Barabara Burch	(904) 232-2741	Barbara.J.Burch@saj02.usace.army.mil
Real Estate	SFWMD	Dennis Meierer	(561) 682-6673	Dmeierer@sfwmd.gov
	SAJ	Cindy Turner	(904) 232-1172	Cindy.B.Turner@saj02.usace.army.mil
Geo-Technical	SFWMD	John Lukasiewicz	(561) 682-6809	jluksa@sfwmd.gov
	SAJ	Karen Pitchford	(904) 232-3295	Karen.R.Pitchford@saj02.usace.army.mil
Census/Economic	SFWMD	Dr. Richard March	(561) 682-6778	rmarch@sfwmd.gov
	SAJ	Kevin Wittman	(904) 232-1107	Kevin.M.Wittman@saj02.usace.army.mil
Environmental	SFWMD	Brian Turcotte	(561) 682-6579	bturcott@sfwmd.gov
	SAJ	Barbara Cintron	(904) 232-1692	Barbara.B.Cintron@saj02.usace.army.mil
Operation & Maintenance	SFWMD	Dr. W Kenneth Stewart	(561) 682-2794	kstewart@sfwmd.gov
	SAJ	TBD		
H & H Modeling RECOVER	SFWMD	Ken Tarbotton	(561) 682-6017	ktarbot@sfwmd.gov
	SAJ	Mike Choate	(904) 232-3143	Michael.L.Choate@saj02.usace.army.mil
H&H Modeling SAJ	SAJ	John Hashtak	(904) 232-2105	<a href="mailto:john.m.hashtak@saj02.usace.army.mil">john.m.hashtak@saj02.usace.army.mil</a>
Water Management	SFWMD	TBD		
	SAJ	Christopher T. Smith	(904) 232-2781	<a href="mailto:christopher.t.smith@saj02.usace.army.mil">christopher.t.smith@saj02.usace.army.mil</a>

**TABLE 2**  
**WORK BREAKDOWN STRUCTURE (WBS)**

<b>CERP WBS</b>	<b>DESCRIPTION</b>
2	CERP Programmatic
2.07	Data Management
2.07.1	PMP
2.07.1.2	Initiate PMP
2.07.1.3	Rough Draft Mgmt Plan/Staff Draft
2.07.1.4	Identify Immediate Needs
2.07.1.5	Prepare Draft Plan
2.07.1.6	Spatial Data Standards
2.07.1.6.1	Identify GIS Standards
2.07.1.6.2	Adopt Standards
2.07.1.6.3	Identify Surveying Standards
2.07.1.6.4	Adopt Surveying Standards
2.07.1.6.5	Identify CADD Standards
2.07.1.6.6	Adopt CADD Standards
2.07.1.6.7	Identify Metadata Standards
2.07.1.6.8	Adopt Metadata Standards
2.07.1.7	Identify Support Data
2.07.1.8	Post on Web for Review
2.07.1.9	Incorporate Comments
2.07.1.10	Procure KEMA Consultant for Review
2.07.1.11	Receive KEMA Report
2.07.1.12	Incorporate Comments
2.07.1.13	Prepare 3rd Draft
2.07.1.7.14	Early Start Approval
2.07.1.15	Prepare 4th Draft
2.07.1.16	Incorporate Comments
2.07.1.20	Distribute to DCT
2.07.1.21	DCT Recommend Approval
1.1.1.18	Post to Web
2.07.1.22	CRG Approval
2.07.1.23	PRB Approval
2.07.1.24	PMP Approved
2.07.1.7.25	Initiate Implementation
2.07.2	Early Start Activities
2.07.2.1	User Needs Analysis
2.07.2.1.1	Initiate Analysis
2.07.2.1.2	Write Scope
2.07.2.1.3	Develop Questionnaire
2.07.2.1.4	Interviews
2.07.2.1.5	Inventory Data Discovered
2.07.2.1.6	Compile and Analyze
2.07.2.1.7	Prepare Report

2.07.2.1.8	Complete UNA
2.07.2.2	Short-Term Data Acquisition
2.07.2.2.1	Initiate
2.07.2.2.2	Write Scope for Landuse/Land Cover
2.07.2.2.3	Collect Parcel Data from Counties
2.07.2.2.4	Write Scopes for 1:24000/1:2400 Base Mapping
2.07.2.2.5	Complete Short-term Tasks
2.07.2.3	Enterprise GIS (eGIS)
2.07.2.3.1	Initiate eGIS
2.07.2.3.2	SAJ
2.07.2.3.2.1	Prepare Preliminary Implementation Plan
2.07.2.3.2.2	Adopt SDS Standards
2.07.2.3.2.3	Adopt Oracle SDE Software Engine
2.07.2.3.2.4	Procure Hardware/Software
2.07.2.3.2.5	Prepare Geodatabase
2.07.2.3.2.5.1	ArcSDW Geometry Test
2.07.2.3.2.5.1.1	Develop test plan
2.07.2.3.2.5.1.2	Prepare testdata and platform
2.07.2.3.2.5.1.3	Run test
2.07.2.3.2.5.1.4	Analyze and report results
2.07.2.3.2.6	Prepare Place-Name Gazetteer
2.07.2.3.2.6.1	Obtain database schema and data from USGS
2.07.2.3.2.6.2	Prototype input and query screens
2.07.2.3.2.6.3	Design footprint tables
2.07.2.3.2.6.4	Transfer data to state
2.07.2.3.2.7	Analyze & Assemble Data
2.07.2.3.2.8	Populate Databases w National Data Sets
2.07.2.3.2.9	Complete Initial eGIS preparation
2.07.2.3.3	SFWMD
2.07.2.3.3.1	Prepare Preliminary Implementation Plan
2.07.2.3.3.2	Adopt SDS Standards
2.07.2.3.3.3	Adopt Oracle SDE Software Engine
2.07.2.3.3.4	Procure Hardware/Software
2.07.2.3.3.5	Prepare Geodatabase
2.07.2.3.3.6	Analyze & Assemble Data
2.07.2.3.3.7	Populate Databases w National Data Sets
2.07.2.3.3.8	Complete Initial eGIS preparation
2.07.2.4	Common Spatial Framework
2.07.2.4.1	Initiate Analysis
2.07.2.4.2	Prepare Conversion Plan
2.07.2.4.3	Identify Projects for Conversion
2.07.2.4.4	Complete Conversion Plan
2.07.3	Short-Term Needs
2.07.3.1	Data Inventory
2.07.3.1.1	Initiate Internal Inventory
2.07.3.1.1.1	SAJ

2.07.3.1.1.2	SFWMD
2.07.3.1.2	Inventory Data
2.07.3.1.2.1	SAJ
2.07.3.1.2.2	SFWMD
2.07.3.1.3	Organize and Collate Data
2.07.3.1.3.1	SAJ
2.07.3.1.3.2	SFWMD
2.07.3.1.4	Prepare Metadata
2.07.3.1.4.1	SAJ
2.07.3.1.4.2	SFWMD
2.07.3.1.5	Complete Inventory
2.07.3.2	Clearinghouse
2.07.3.2.1	Prepare Clearinghouse Procedures
2.07.3.2.2	Migrate Data and Links to Clearinghouse
2.07.3.2.2.1	SAJ
2.07.3.2.2.2	SFWMD
2.07.3.2.3	Post Metadata to Clearinghouse
2.07.3.2.3.1	SAJ
2.07.3.2.3.2	SFWMD
2.07.3.2.4	Commence Clearinghouse Operations
2.07.3.3	Data Requirements Documentation
2.07.3.3.1	Receive Final Results of UNA
2.07.3.3.2	Assemble Results
2.07.3.3.3	Document Results
2.07.3.3.4	Receive Final Documents
2.07.3.4	CERP Zone eGIS
2.07.3.4.1	Migrate Applications
2.07.3.4.2	Operational Tests
2.07.3.4.3	Assign Data Stewards & Theme Responsibility
2.07.3.4.3.1	SAJ
2.07.3.4.3.2	SFWMD
2.07.3.4.4	Populate Database
2.07.3.4.5	Startup of Production Database
2.07.3.4.6	Complete eGIS Implementation
2.07.3.5	CADD Implementation Plan
2.07.3.5.1	Initiate Implementation Plan Preparation
2.07.3.5.1.2	Prepare Implementation Plan
2.07.3.5.1.2.1	SAJ Input
2.07.3.5.1.2.2	SFWMD Input
2.07.3.5.1.3	Identify Training Needs
2.07.3.5.1.4	Finalize Plan
2.07.3.5.1.5	Implement Plan
2.07.3.5.1.6	Train users
2.07.3.6	Survey Standards Implementation Plan
2.07.3.6.1	Post Standards to Web
2.07.3.6.1	Implement Standards

2.07.3.7	Common Spatial Data Framework Plan
2.07.3.7.1	Initiate Plan
2.07.3.7.2	Research Survey Control
2.07.3.7.2.1	Everglades Construction Project
2.07.3.7.2.2	Indian River Lagoon Feasibility
2.07.3.7.2.3	Water Preserve areas
2.07.3.7.2.4	Lake Okeechobee & Herbert Hoover Dike
2.07.3.7.2.5	C-51
2.07.3.7.2.6	C-111
2.07.3.7.2.7	Mod Waters to ENP
2.07.3.7.2.8	East Coast Canal Structures C-4
2.07.3.7.2.9	Western C-11
2.07.3.7.2.10	Southern Crew
2.07.3.7.2.11	Lake Trafford
2.07.3.7.2.12	Seminole Big Cypress
2.07.3.7.2.13	Florida Keys Carrying Capacity
2.07.3.7.2.14	Tamiami Trail Culverts
2.07.3.7.2.15	Ten Mile Creek
2.07.3.7.2.16	C-44 Basin Storage Reservoir
2.07.3.7.2.17	EAA
2.07.3.7.2.18	Site 1 Impoundment
2.07.3.7.2.19	WCA 3A/B
2.07.3.7.2.10	C-11 Impoundment & STA
2.07.3.7.2.11	Taylor Creek/Nubbin Slough
2.07.3.7.212	Raise & Bridge Tamiami Trail
2.07.3.7.2.13	North New River Improvements
2.07.3.7.2.14	C-111 North Spreader Canal
2.07.3.7.3	Identify Projects for Data Reprocessing
2.07.3.7.3.1	SAJ
2.07.3.7.3.2	SFWMD
2.07.3.7.4	Prepare Scope & Estimate for Conversion
2.07.3.7.5	Projects for Field Ties to CERP Network
2.07.3.7.5.1	Prepare Scope & Estimate For Surveys
2.07.3.7.5.2	Issue NTP
2.07.3.7.5.3	Field Survey (GPS) (15 Projects Est)
2.07.3.7.5.4	Complete Field Survey
2.07.3.7.5.5	Process Data
2.07.3.7.5.6	Complete Field Ties
2.07.3.7.6	Identify Gauging Stations and Wells
2.07.3.7.7	Map Wells
2.07.3.7.8	Initiate Surveys WCA-1 (5 gauges)
2.07.3.7.9	Complete Surveys
2.07.3.7.10	Post Metadata
2.07.3.7.11	Survey complete
2.07.3.7.12	Initiate Surveys 55 Priority Gauges
2.07.3.7.13	Complete Surveys

2.07.3.7.14	Post Metadata
2.07.3.7.15	Survey complete
2.07.3.7.16	Initiate Surveys 53 Priority Gauges
2.07.3.7.5.17	Complete Surveys
2.07.3.7.5.18	Post Metadata
2.07.3.7.5.19	Survey complete
2.07.3.7.5.20	Initiate Surveys 135 Structures
2.07.3.7.5.21	Complete Surveys
2.07.3.7.5.22	Post Metadata
2.07.3.7.5.23	Survey complete
2.07.3.7.5.24	Initiate Surveys to 700 Gauges
2.07.3.7.5.25	Prepare Contracting Documents
2.07.3.7.5.26	Issue Notice to Proceed
2.07.3.7.5.27	Survey Sites
2.07.3.7.5.28	QA/QC Data
2.07.3.7.5.29	Prepare Metadata
2.07.3.7.5.30	Post Metadata
2.07.3.7.5.31	Complete Surveys
2.07.3.8	Support Data Implementation Plan
2.07.3.8.1	Appoint Technical Leads
2.07.3.8.1.1	SAJ
2.07.3.8.1.2	SFWMD
2.07.3.8.2	Identify Support Data
2.07.3.8.3	Prepare Plan
2.07.3.8.4	Post on Web for Comments
2.07.3.8.5	Incorporate Comments
2.07.3.8.6	Plan Approval
2.07.3.8.7	Implement Plan
2.07.3.9	Information Technology Plan
2.07.3.9.1	Initiate Plan
2.07.3.9.2	Develop Alternatives
2.07.3.9.3	Screen Alternatives
2.07.3.9.4	Select Feasible Alternatives for Further Evaluation
2.07.3.9.5	Scope Alternatives & Prepare ROI
2.07.3.9.6	DCT Recommend Approval
2.07.3.9.7	CRG Approval
2.07.3.9.8	PRB Approval
2.07.4	Long-term Needs
2.07.4.1	Implement Recommended Plan
2.07.5	Full Implementation
2.07.6	Update and Maintain

# TABLE 3. CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
1	2	<b>CERP Programmatic</b>	<b>9665 d</b>	<b>Fri 2/9/01</b>	<b>Mon 9/20/38</b>		<b>\$4,483,260</b>	<b>\$4,128,240</b>	<b>\$8,611,500</b>	
2	2.07	<b>Data Management</b>	<b>798 d</b>	<b>Fri 2/9/01</b>	<b>Tue 4/13/04</b>		<b>\$0</b>	<b>\$0</b>	<b>\$8,611,500</b>	
3	2.07.1	<b>Phase 1 - PMP</b>	<b>280 d</b>	<b>Fri 2/9/01</b>	<b>Fri 3/22/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$150,000</b>	
4	2.07.1.2	Initiate PMP	0 d	Fri 2/9/01	Fri 2/9/01		\$0	\$0	\$0	SFWMD
5	2.07.1.3	Rough Draft Mgmt Plan/Staff Draft	20 d	Tue 4/10/01	Mon 5/7/01	4	\$0	\$0	\$0	SFWMD
6	2.07.1.4	Identify Immediate Needs	5 d	Tue 5/8/01	Mon 5/14/01	5	\$0	\$0	\$0	SFWMD
7	2.07.1.5	Prepare Draft Plan	62 d	Tue 5/8/01	Wed 8/1/01	4,5	\$0	\$0	\$0	SFWMD
8	2.07.1.6	<b>Spatial Data Standards</b>	<b>214 d</b>	<b>Tue 5/15/01</b>	<b>Fri 3/22/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
9	2.07.1.6.1	Identify GIS Standards	164 d	Tue 5/15/01	Wed 1/9/02	6	\$0	\$0	\$0	CESAJ-IM-I
10	2.07.1.6.2	Adopt Standards	50 d	Thu 1/10/02	Fri 3/22/02	9	\$0	\$0	\$0	SFWMD
11	2.07.1.6.3	Identify Surveying Standards	158 d	Tue 5/15/01	Mon 12/31/01	6	\$0	\$0	\$0	CESAJ-DR-P
12	2.07.1.6.4	Adopt Surveying Standards	56 d	Wed 1/2/02	Fri 3/22/02	11	\$0	\$0	\$0	SFWMD
13	2.07.1.6.5	Identify CADD Standards	178 d	Tue 5/15/01	Wed 1/30/02	6	\$0	\$0	\$0	CESAJ-EN-T
14	2.07.1.6.6	Adopt CADD Standards	36 d	Thu 1/31/02	Fri 3/22/02	13	\$0	\$0	\$0	SFWMD
15	2.07.1.6.7	Identify Metadata Standards	164 d	Tue 5/15/01	Wed 1/9/02	6	\$0	\$0	\$0	CESAJ-IM-I
16	2.07.1.6.8	Adopt Metadata Standards	50 d	Thu 1/10/02	Fri 3/22/02	15	\$0	\$0	\$0	SFWMD
17	2.07.1.7	Identify Support Data	280 d	Fri 2/9/01	Fri 3/22/02	4	\$0	\$0	\$0	SFWMD
18	2.07.1.8	Post on Web for Review	1 d	Thu 8/2/01	Thu 8/2/01	7	\$0	\$0	\$0	SFWMD
19	2.07.1.9	Incorporate Comments	20 d	Fri 8/3/01	Thu 8/30/01	18	\$0	\$0	\$0	SFWMD
20	2.07.1.10	Procure KEMA Consultant for Review	15 d	Mon 6/11/01	Fri 6/29/01	4	\$0	\$0	\$0	SFWMD
21	2.07.1.11	Receive KEMA Report	0 d	Fri 6/29/01	Fri 6/29/01	20	\$0	\$30,000	\$30,000	SFWMD
22	2.07.1.12	Incorporate Comments	20 d	Mon 7/2/01	Fri 7/27/01	21	\$0	\$0	\$0	SFWMD
23	2.07.1.13	Prepare 3rd Draft	10 d	Fri 8/31/01	Thu 9/27/01	19,22	\$0	\$0	\$0	SFWMD
24	2.07.1.7.14	Early Start Approval	16 d	Fri 9/28/01	Mon 10/22/01	23	\$0	\$0	\$0	SFWMD
25	2.07.1.15	Prepare 4th Draft	79 d	Tue 10/23/01	Fri 2/15/02	24	\$0	\$0	\$0	SFWMD
26	2.07.1.16	Incorporate Comments	2 d	Mon 2/18/02	Tue 2/19/02	25	\$0	\$0	\$0	SFWMD
27	2.07.1.20	Distribute to DCT	6 d	Wed 2/27/02	Wed 3/6/02	26FS+5 d	\$0	\$0	\$0	SFWMD
28	2.07.1.21	DCT Recommend Approval	0 d	Wed 3/6/02	Wed 3/6/02	27	\$0	\$0	\$0	SFWMD
29	1.1.1.18	Post to Web	1 d	Wed 2/27/02	Wed 2/27/02	27SS	\$0	\$0	\$0	
30	2.07.1.22	CRG Approval	12 d	Thu 3/7/02	Fri 3/22/02	28	\$0	\$0	\$0	SFWMD
31	2.07.1.23	PRB Approval	12 d	Thu 3/7/02	Fri 3/22/02	28	\$0	\$0	\$0	CESAJ-DR-P
32	2.07.1.24	PMP Approved	0 d	Fri 3/22/02	Fri 3/22/02	31,30	\$0	\$0	\$0	SFWMD
33	2.07.1.7.25	Initiate Implementation	0 d	Fri 3/22/02	Fri 3/22/02	32	\$60,000	\$60,000	\$120,000	SFWMD
34	2.07.2	<b>Phase II - Early Start Activities</b>	<b>432 d</b>	<b>Mon 10/22/01</b>	<b>Fri 7/11/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$2,241,000</b>	
35	2.07.2.1	<b>User Needs Analysis</b>	<b>100 d</b>	<b>Mon 10/22/01</b>	<b>Tue 3/19/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$20,000</b>	
36	2.07.2.1.1	Initiate Analysis	0 d	Mon 10/22/01	Mon 10/22/01	24	\$0	\$0	\$0	SFWMD

# CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
37	2.07.2.1.2	Write Scope	15 d	Tue 10/23/01	Tue 11/13/01	36	\$0	\$0	\$0	SFWMD
38	2.07.2.1.3	Develop Questionnaire	5 d	Wed 11/14/01	Tue 11/20/01	37	\$0	\$0	\$0	SFWMD
39	2.07.2.1.4	Interviews	15 d	Wed 11/21/01	Wed 12/12/01	38	\$0	\$0	\$0	SFWMD
40	2.07.2.1.5	Inventory Data Discovered	30 d	Thu 12/13/01	Mon 1/28/02	39	\$0	\$0	\$0	SFWMD
41	2.07.2.1.6	Compile and Analyze	30 d	Tue 1/29/02	Tue 3/12/02	40	\$0	\$0	\$0	SFWMD
42	2.07.2.1.7	Prepare Report	5 d	Wed 3/13/02	Tue 3/19/02	41	\$0	\$0	\$0	SFWMD
43	2.07.2.1.8	Complete UNA	0 d	Tue 3/19/02	Tue 3/19/02	42	\$0	\$20,000	\$20,000	SFWMD
44	<b>2.07.2.2</b>	<b>Short-Term Data Acquisition</b>	<b>150 d</b>	<b>Mon 10/22/01</b>	<b>Wed 5/29/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$100,000</b>	
45	2.07.2.2.1	Initiate	0 d	Mon 10/22/01	Mon 10/22/01	24	\$0	\$0	\$0	SFWMD
46	2.07.2.2.2	Write Scope for Landuse/Land Cover	150 d	Tue 10/23/01	Wed 5/29/02	45	\$0	\$20,000	\$20,000	SFWMD
47	2.07.2.2.3	Collect Parcel Data from Counties	150 d	Tue 10/23/01	Wed 5/29/02	45	\$0	\$60,000	\$60,000	SFWMD
48	2.07.2.2.4	Write Scopes for 1:24000/1:2400 Base Mapping	150 d	Tue 10/23/01	Wed 5/29/02	45	\$0	\$20,000	\$20,000	SFWMD
49	2.07.2.2.5	Complete Short-term Tasks	0 d	Wed 5/29/02	Wed 5/29/02	46,47,48	\$0	\$0	\$0	SFWMD
50	<b>2.07.2.3</b>	<b>Enterprise GIS (eGIS)</b>	<b>432 d</b>	<b>Tue 10/23/01</b>	<b>Fri 7/11/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$2,116,000</b>	
51	2.07.2.3.1	Initiate eGIS	1 d	Tue 10/23/01	Tue 10/23/01	24	\$0	\$0	\$0	SFWMD
52	<b>2.07.2.3.2</b>	<b>SAJ</b>	<b>431 d</b>	<b>Wed 10/24/01</b>	<b>Fri 7/11/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$640,000</b>	
53	2.07.2.3.2.1	Prepare Preliminary Implementation Plan	30 d	Wed 10/24/01	Thu 12/6/01	51	\$300,000	\$0	\$300,000	CESAJ-IM-I
54	2.07.2.3.2.2	Adopt SDS Standards	0 d	Thu 12/6/01	Thu 12/6/01	53	\$0	\$0	\$0	CESAJ-IM-I
55	2.07.2.3.2.3	Adopt Oracle SDE Software Engine	0 d	Thu 12/6/01	Thu 12/6/01	54	\$0	\$0	\$0	CESAJ-IM-I
56	2.07.2.3.2.4	Procure Hardware/Software	60 d	Wed 10/24/01	Tue 1/22/02	51	\$280,000	\$0	\$280,000	CESAJ-IM-I
57	<b>2.07.2.3.2.5</b>	<b>Prepare Geodatabase</b>	<b>184 d</b>	<b>Mon 1/28/02</b>	<b>Thu 10/17/02</b>	<b>51</b>	<b>\$0</b>	<b>\$0</b>	<b>\$30,000</b>	
58	<b>2.07.2.3.2.5.1</b>	<b>ArcSDW Geometry Test</b>	<b>184 d</b>	<b>Mon 1/28/02</b>	<b>Thu 10/17/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$30,000</b>	
59	2.07.2.3.2.5.1.1	Develop test plan	26 d	Mon 1/28/02	Tue 3/5/02		\$0	\$0	\$0	ERDAC
60	2.07.2.3.2.5.1.2	Prepare testdata and platform	84 d	Wed 3/6/02	Tue 7/2/02	59	\$0	\$0	\$0	ERDAC
61	2.07.2.3.2.5.1.3	Run test	10 d	Wed 7/3/02	Wed 7/17/02	60	\$0	\$0	\$0	ERDAC
62	2.07.2.3.2.5.1.4	Analyze and report results	64 d	Thu 7/18/02	Thu 10/17/02	61	\$30,000	\$0	\$30,000	ERDAC
63	<b>2.07.2.3.2.6</b>	<b>Prepare Place-Name Gazetteer</b>	<b>229 d</b>	<b>Thu 2/14/02</b>	<b>Fri 1/10/03</b>	<b>57SS</b>	<b>\$0</b>	<b>\$0</b>	<b>\$30,000</b>	
64	2.07.2.3.2.6.1	Obtain database schema and data from I	6 d	Thu 2/14/02	Fri 2/22/02		\$0	\$0	\$0	CESAJ-IM-I
65	2.07.2.3.2.6.2	Prototype input and query screens	30 d	Mon 2/25/02	Fri 4/5/02	64	\$0	\$0	\$0	CESAJ-IM-I
66	2.07.2.3.2.6.3	Design footprint tables	90 d	Wed 5/15/02	Sun 9/22/02	65	\$30,000	\$0	\$30,000	USGS
67	2.07.2.3.2.6.4	Transfer data to state	1 d	Fri 1/10/03	Fri 1/10/03	66	\$0	\$0	\$0	CESAJ-IM-I
68	2.07.2.3.2.7	Analyze & Assemble Data	180 d	Thu 10/24/02	Fri 7/11/03	57SS	\$0	\$0	\$0	CESAJ-IM-I
69	2.07.2.3.2.8	Populate Databases w National Data Sets	180 d	Mon 1/28/02	Thu 10/10/02	57SS	\$0	\$0	\$0	CESAJ-IM-I
70	2.07.2.3.2.9	Complete Initial eGIS preparation	0 d	Thu 10/10/02	Thu 10/10/02	69	\$0	\$0	\$0	CESAJ-IM-I
71	<b>2.07.2.3.3</b>	<b>SFWMD</b>	<b>236 d</b>	<b>Tue 10/23/01</b>	<b>Mon 9/30/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$1,476,000</b>	
72	2.07.2.3.3.1	Prepare Preliminary Implementation Plan	30 d	Tue 10/23/01	Wed 12/5/01	24	\$0	\$0	\$0	SFWMD



# CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
73	2.07.2.3.3.2	Adopt SDS Standards	0 d	Wed 12/5/01	Wed 12/5/01	72	\$0	\$0	\$0	SFWMD
74	2.07.2.3.3.3	Adopt Oracle SDE Software Engine	0 d	Wed 12/5/01	Wed 12/5/01	72	\$0	\$0	\$0	SFWMD
75	2.07.2.3.3.4	Procure Hardware/Software	150 d	Tue 10/23/01	Wed 5/29/02	24	\$0	\$0	\$0	SFWMD
76	2.07.2.3.3.5	Prepare Geodatabase	236 d	Tue 10/23/01	Mon 9/30/02	72SS	\$1,200,000	\$276,000	\$1,476,000	SFWMD,SAJ
77	2.07.2.3.3.6	Analyze & Assemble Data	236 d	Tue 10/23/01	Mon 9/30/02	72SS	\$0	\$0	\$0	SFWMD
78	2.07.2.3.3.7	Populate Databases w National Data Sets	236 d	Tue 10/23/01	Mon 9/30/02	72SS	\$0	\$0	\$0	SFWMD
79	2.07.2.3.3.8	Complete Initial eGIS preparation	0 d	Mon 9/30/02	Mon 9/30/02	78	\$0	\$0	\$0	SFWMD
80	<b>2.07.2.4</b>	<b>Common Spatial Framework</b>	<b>85 d</b>	<b>Mon 10/22/01</b>	<b>Tue 2/26/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	
81	2.07.2.4.1	Initiate Analysis	0 d	Mon 10/22/01	Mon 10/22/01	24	\$0	\$0	\$0	CESAJ-DR-P
82	2.07.2.4.2	Prepare Conversion Plan	60 d	Tue 10/23/01	Fri 1/18/02	81	\$0	\$0	\$0	CESAJ-EN-DT
83	2.07.2.4.3	Identify Projects for Conversion	25 d	Tue 1/22/02	Tue 2/26/02	82	\$0	\$0	\$0	CESAJ-DR-P
84	2.07.2.4.4	Complete Conversion Plan	0 d	Tue 2/26/02	Tue 2/26/02	83	\$0	\$0	\$5,000	CESAJ-EN-DT
85	<b>2.07.3</b>	<b>Phase II - Short-Term Needs</b>	<b>536 d</b>	<b>Wed 2/27/02</b>	<b>Tue 4/13/04</b>		<b>\$0</b>	<b>\$0</b>	<b>\$2,220,500</b>	
86	<b>2.07.3.1</b>	<b>Data Inventory</b>	<b>90 d</b>	<b>Fri 3/22/02</b>	<b>Tue 7/30/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$35,000</b>	
87	<b>2.07.3.1.1</b>	<b>Initiate Internal Inventory</b>	<b>0 d</b>	<b>Fri 3/22/02</b>	<b>Fri 3/22/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
88	2.07.3.1.1.1	SAJ	0 d	Fri 3/22/02	Fri 3/22/02	33	\$0	\$0	\$0	CESAJ-DR-P
89	2.07.3.1.1.2	SFWMD	0 d	Fri 3/22/02	Fri 3/22/02	33SS	\$0	\$0	\$0	SFWMD
90	<b>2.07.3.1.2</b>	<b>Inventory Data</b>	<b>60 d</b>	<b>Mon 3/25/02</b>	<b>Mon 6/17/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$20,000</b>	
91	2.07.3.1.2.1	SAJ	60 d	Mon 3/25/02	Mon 6/17/02	88	\$10,000	\$0	\$10,000	CESAJ-IM-I
92	2.07.3.1.2.2	SFWMD	60 d	Mon 3/25/02	Mon 6/17/02	89	\$0	\$10,000	\$10,000	SFWMD
93	<b>2.07.3.1.3</b>	<b>Organize and Collate Data</b>	<b>30 d</b>	<b>Tue 6/18/02</b>	<b>Tue 7/30/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$10,000</b>	
94	2.07.3.1.3.1	SAJ	30 d	Tue 6/18/02	Tue 7/30/02	91	\$5,000	\$0	\$5,000	CESAJ-IM-I
95	2.07.3.1.3.2	SFWMD	30 d	Tue 6/18/02	Tue 7/30/02	92	\$0	\$5,000	\$5,000	SFWMD
96	<b>2.07.3.1.4</b>	<b>Prepare Metadata</b>	<b>90 d</b>	<b>Mon 3/25/02</b>	<b>Tue 7/30/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	
97	2.07.3.1.4.1	SAJ	90 d	Mon 3/25/02	Tue 7/30/02	91SS	\$2,500	\$0	\$2,500	CESAJ-IM-I
98	2.07.3.1.4.2	SFWMD	90 d	Mon 3/25/02	Tue 7/30/02	92SS	\$0	\$2,500	\$2,500	SFWMD
99	2.07.3.1.5	Complete Inventory	0 d	Tue 7/30/02	Tue 7/30/02	98	\$0	\$0	\$0	SFWMD
100	<b>2.07.3.2</b>	<b>Clearinghouse</b>	<b>180 d</b>	<b>Mon 3/25/02</b>	<b>Mon 12/9/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$15,000</b>	
101	2.07.3.2.1	Prepare Clearinghouse Procedures	10 d	Mon 3/25/02	Fri 4/5/02	33	\$2,500	\$2,500	\$5,000	CESAJ-IM-I
102	<b>2.07.3.2.2</b>	<b>Migrate Data and Links to Clearinghouse</b>	<b>60 d</b>	<b>Wed 7/31/02</b>	<b>Thu 10/24/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	
103	2.07.3.2.2.1	SAJ	60 d	Wed 7/31/02	Thu 10/24/02	99	\$2,500	\$0	\$2,500	CESAJ-IM-I
104	2.07.3.2.2.2	SFWMD	60 d	Wed 7/31/02	Thu 10/24/02	99	\$0	\$2,500	\$2,500	SFWMD
105	<b>2.07.3.2.3</b>	<b>Post Metadata to Clearinghouse</b>	<b>30 d</b>	<b>Fri 10/25/02</b>	<b>Mon 12/9/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	
106	2.07.3.2.3.1	SAJ	30 d	Fri 10/25/02	Mon 12/9/02	104	\$2,500	\$0	\$2,500	CESAJ-IM-I
107	2.07.3.2.3.2	SFWMD	30 d	Fri 10/25/02	Mon 12/9/02	104	\$0	\$2,500	\$2,500	SFWMD
108	2.07.3.2.4	Commence Clearinghouse Operations	0 d	Mon 12/9/02	Mon 12/9/02	107	\$0	\$0	\$0	SFWMD

# CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
109	<b>2.07.3.3</b>	<b>Data Requirements Documentation</b>	<b>21 d</b>	<b>Wed 3/20/02</b>	<b>Wed 4/17/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	
110	2.07.3.3.1	Receive Final Results of UNA	1 d	Wed 3/20/02	Wed 3/20/02	43	\$0	\$0	\$0	SFWMD
111	2.07.3.3.2	Assemble Results	10 d	Thu 3/21/02	Wed 4/3/02	110	\$0	\$0	\$0	SFWMD
112	2.07.3.3.3	Document Results	10 d	Thu 4/4/02	Wed 4/17/02	111	\$0	\$5,000	\$5,000	SFWMD
113	2.07.3.3.4	Receive Final Documents	0 d	Wed 4/17/02	Wed 4/17/02	112	\$0	\$0	\$0	SFWMD
114	<b>2.07.3.4</b>	<b>CERP Zone eGIS</b>	<b>141 d</b>	<b>Fri 10/11/02</b>	<b>Mon 5/5/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$930,000</b>	
115	2.07.3.4.1	Migrate Applications	60 d	Fri 10/11/02	Wed 1/8/03	70	\$10,000	\$10,000	\$20,000	CESAJ-IM-I,SFWMD
116	2.07.3.4.2	Operational Tests	20 d	Thu 1/9/03	Thu 2/6/03	115	\$0	\$10,000	\$10,000	SFWMD
117	<b>2.07.3.4.3</b>	<b>Assign Data Stewards &amp; Theme Responsibility</b>	<b>1 d</b>	<b>Thu 1/9/03</b>	<b>Thu 1/9/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
118	2.07.3.4.3.1	SAJ	1 d	Thu 1/9/03	Thu 1/9/03	115	\$0	\$0	\$0	CESAJ-IM-I
119	2.07.3.4.3.2	SFWMD	1 d	Thu 1/9/03	Thu 1/9/03	115	\$0	\$0	\$0	SFWMD
120	2.07.3.4.4	Populate Database	60 d	Fri 2/7/03	Fri 5/2/03	116	\$0	\$0	\$0	SFWMD
121	2.07.3.4.5	Startup of Production Database	0 d	Fri 5/2/03	Fri 5/2/03	120	\$0	\$0	\$0	CESAJ-IM-I
122	2.07.3.4.6	Complete eGIS Implementation	1 d	Mon 5/5/03	Mon 5/5/03	121	\$450,000	\$450,000	\$900,000	SFWMD
123	<b>2.07.3.5</b>	<b>CADD Implementation Plan</b>	<b>120 d</b>	<b>Fri 3/22/02</b>	<b>Wed 9/11/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$80,000</b>	
124	2.07.3.5.1	Initiate Implementation Plan Preparation	0 d	Fri 3/22/02	Fri 3/22/02	33	\$0	\$0	\$0	CESAJ-EN-T
125	<b>2.07.3.5.1.2</b>	<b>Prepare Implementation Plan</b>	<b>45 d</b>	<b>Mon 3/25/02</b>	<b>Fri 5/24/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$60,000</b>	
126	2.07.3.5.1.2.1	SAJ Input	45 d	Mon 3/25/02	Fri 5/24/02	124	\$30,000	\$0	\$30,000	CESAJ-EN-T
127	2.07.3.5.1.2.2	SFWMD Input	45 d	Mon 3/25/02	Fri 5/24/02	124	\$0	\$30,000	\$30,000	SFWMD
128	2.07.3.5.1.3	Identify Training Needs	10 d	Tue 5/28/02	Mon 6/10/02	127	\$0	\$0	\$0	CESAJ-EN-T
129	2.07.3.5.1.4	Finalize Plan	5 d	Tue 6/11/02	Mon 6/17/02	128	\$0	\$0	\$0	CESAJ-EN-T
130	2.07.3.5.1.5	Implement Plan	0 d	Mon 6/17/02	Mon 6/17/02	129	\$0	\$0	\$0	CESAJ-EN-T
131	2.07.3.5.1.6	Train users	60 d	Tue 6/18/02	Wed 9/11/02	130	\$20,000	\$0	\$20,000	CESAJ-EN-T
132	<b>2.07.3.6</b>	<b>Survey Standards Implementation Plan</b>	<b>10 d</b>	<b>Mon 3/25/02</b>	<b>Fri 4/5/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
133	2.07.3.6.1	Post Standards to Web	10 d	Mon 3/25/02	Fri 4/5/02	33	\$0	\$0	\$0	CESAJ-DR-P
134	2.07.3.6.1	Implement Standards	0 d	Fri 4/5/02	Fri 4/5/02	133	\$0	\$0	\$0	CESAJ-DR-P
135	<b>2.07.3.7</b>	<b>Common Spatial Data Framework Implementation P</b>	<b>536 d</b>	<b>Wed 2/27/02</b>	<b>Tue 4/13/04</b>		<b>\$0</b>	<b>\$0</b>	<b>\$1,085,500</b>	
136	2.07.3.7.1	Initiate Plan	0 d	Fri 4/5/02	Fri 4/5/02	33FS+10 d	\$0	\$0	\$0	
137	<b>2.07.3.7.2</b>	<b>Research Survey Control</b>	<b>90 d</b>	<b>Mon 4/8/02</b>	<b>Tue 8/13/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$40,000</b>	
138	2.07.3.7.2.1	Everglades Construction Project	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$5,000	\$5,000	SFWMD
139	2.07.3.7.2.2	Indian River Lagoon Feasibility	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$2,500	\$2,500	CESAJ-EN-DT
140	2.07.3.7.2.3	Water Preserve areas	90 d	Mon 4/8/02	Tue 8/13/02	136	\$2,500	\$0	\$2,500	CESAJ-EN-DT
141	2.07.3.7.2.4	Lake Okeechobee & Herbert Hoover Dike	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$5,000	\$5,000	SFWMD
142	2.07.3.7.2.5	C-51	90 d	Mon 4/8/02	Tue 8/13/02	136	\$2,500	\$0	\$2,500	CESAJ-EN-DT
143	2.07.3.7.2.6	C-111	90 d	Mon 4/8/02	Tue 8/13/02	136	\$2,500	\$0	\$2,500	CESAJ-EN-DT
144	2.07.3.7.2.7	Mod Waters to ENP	90 d	Mon 4/8/02	Tue 8/13/02	136	\$2,500	\$0	\$2,500	CESAJ-EN-DT

# CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
145	2.07.3.7.2.8	East Coast Canal Structures C-4	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$2,500	\$2,500	CESAJ-EN-DT
146	2.07.3.7.2.9	Western C-11	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$2,500	\$2,500	CESAJ-EN-DT
147	2.07.3.7.2.10	Southern Crew	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$2,500	\$2,500	CESAJ-EN-DT
148	2.07.3.7.2.11	Lake Trafford	90 d	Mon 4/8/02	Tue 8/13/02	136	\$2,500	\$0	\$2,500	CESAJ-EN-DT
149	2.07.3.7.2.12	Seminole Big Cypress	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$2,500	\$2,500	CESAJ-EN-DT
150	2.07.3.7.2.13	Florida Keys Carrying Capacity	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$2,500	\$2,500	CESAJ-EN-DT
151	2.07.3.7.2.14	Tamiami Trail Culverts	90 d	Mon 4/8/02	Tue 8/13/02	136	\$2,500	\$0	\$2,500	CESAJ-EN-DT
152	2.07.3.7.2.15	Ten Mile Creek	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
153	2.07.3.7.2.16	C-44 Basin Storage Reservoir	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
154	2.07.3.7.2.17	EAA	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
155	2.07.3.7.2.18	Site 1 Impoundment	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
156	2.07.3.7.2.19	WCA 3A/B	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	CESAJ-EN-DT
157	2.07.3.7.2.10	C-11 Impoundment & STA	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
158	2.07.3.7.2.11	Taylor Creek/Nubbin Slough	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
159	2.07.3.7.2.12	Raise & Bridge Tamiami Trail	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	CESAJ-EN-T
160	2.07.3.7.2.13	North New River Improvements	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	SFWMD
161	2.07.3.7.2.14	C-111 North Spreader Canal	90 d	Mon 4/8/02	Tue 8/13/02	136	\$0	\$0	\$0	CESAJ-EN-T
162	<b>2.07.3.7.3</b>	<b>Identify Projects for Data Reprocessing</b>	<b>120 d</b>	<b>Wed 8/14/02</b>	<b>Wed 2/5/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>	
163	2.07.3.7.3.1	SAJ	60 d	Wed 8/14/02	Thu 11/7/02	161	\$2,500	\$0	\$2,500	CESAJ-DR-P
164	2.07.3.7.3.2	SFWMD	60 d	Fri 11/8/02	Wed 2/5/03	163	\$0	\$2,500	\$2,500	SFWMD
165	2.07.3.7.4	Prepare Scope & Estimate for Conversion	30 d	Thu 2/6/03	Thu 3/20/03	164	\$0	\$0	\$0	CESAJ-EN-DT
166	<b>2.07.3.7.5</b>	<b>Projects for Field Ties to CERP Network</b>	<b>148 d</b>	<b>Wed 8/14/02</b>	<b>Tue 3/18/03</b>		<b>\$0</b>	<b>\$0</b>	<b>\$385,000</b>	
167	2.07.3.7.5.1	Prepare Scope & Estimate For Surveys	42 d	Wed 8/14/02	Fri 10/11/02	161	\$0	\$0	\$0	SAJ-EN-DT, CESAJ-EN-T
168	2.07.3.7.5.2	Issue NTP	1 d	Tue 10/15/02	Tue 10/15/02	167	\$0	\$0	\$0	CESAJ-CT-C
169	2.07.3.7.5.3	Field Survey (GPS) (15 Projects Est)	90 d	Wed 10/16/02	Tue 2/25/03	168	\$385,000	\$0	\$385,000	CESAJ-EN-DT
170	2.07.3.7.5.4	Complete Field Survey	0 d	Tue 2/25/03	Tue 2/25/03	169	\$0	\$0	\$0	CESAJ-EN-DT
171	2.07.3.7.5.5	Process Data	15 d	Wed 2/26/03	Tue 3/18/03	170	\$0	\$0	\$0	CESAJ-EN-DT
172	2.07.3.7.5.6	Complete Field Ties	0 d	Tue 3/18/03	Tue 3/18/03	171	\$0	\$0	\$0	CESAJ-EN-DT
173	2.07.3.7.6	Identify Gauging Stations and Wells	10 d	Wed 2/27/02	Tue 3/12/02	84	\$0	\$0	\$0	SFWMD
174	2.07.3.7.7	Map Wells	10 d	Wed 3/13/02	Tue 3/26/02	173	\$0	\$0	\$0	SFWMD
175	2.07.3.7.8	Initiate Surveys WCA-1 (5 gauges)	0 d	Tue 3/26/02	Tue 3/26/02	174	\$0	\$5,500	\$5,500	SFWMD
176	2.07.3.7.9	Complete Surveys	10 d	Wed 3/27/02	Tue 4/9/02	175	\$0	\$0	\$0	SFWMD
177	2.07.3.7.10	Post Metadata	1 d	Wed 4/10/02	Wed 4/10/02	176	\$0	\$0	\$0	SFWMD
178	2.07.3.7.11	Survey complete	0 d	Wed 4/10/02	Wed 4/10/02	177	\$0	\$0	\$0	SFWMD
179	2.07.3.7.12	Initiate Surveys 55 Priority Gauges	30 d	Thu 4/11/02	Wed 5/22/02	178	\$0	\$0	\$0	SFWMD
180	2.07.3.7.13	Complete Surveys	60 d	Thu 5/23/02	Fri 8/16/02	179	\$0	\$65,000	\$65,000	SFWMD

# CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
181	2.07.3.7.14	Post Metadata	1 d	Mon 8/19/02	Mon 8/19/02	180	\$0	\$0	\$0	SFWMD
182	2.07.3.7.15	Survey complete	0 d	Mon 8/19/02	Mon 8/19/02	181	\$0	\$0	\$0	SFWMD
183	2.07.3.7.16	Initiate Surveys 53 Priority Gauges	30 d	Tue 8/20/02	Tue 10/1/02	182	\$0	\$60,000	\$60,000	SFWMD
184	2.07.3.7.5.17	Complete Surveys	90 d	Wed 10/2/02	Tue 2/11/03	183	\$0	\$0	\$0	SFWMD
185	2.07.3.7.5.18	Post Metadata	1 d	Wed 2/12/03	Wed 2/12/03	184	\$0	\$0	\$0	SFWMD
186	2.07.3.7.5.19	Survey complete	0 d	Wed 2/12/03	Wed 2/12/03	185	\$0	\$0	\$0	SFWMD
187	2.07.3.7.5.20	Initiate Surveys 135 Structures	30 d	Thu 2/13/03	Thu 3/27/03	186	\$0	\$150,000	\$150,000	SFWMD
188	2.07.3.7.5.21	Complete Surveys	90 d	Fri 3/28/03	Mon 8/4/03	187	\$0	\$0	\$0	SFWMD
189	2.07.3.7.5.22	Post Metadata	1 d	Tue 8/5/03	Tue 8/5/03	188	\$0	\$0	\$0	SFWMD
190	2.07.3.7.5.23	Survey complete	0 d	Tue 8/5/03	Tue 8/5/03	189	\$0	\$0	\$0	SFWMD
191	2.07.3.7.5.24	Initiate Surveys to 350 sites	0 d	Tue 8/5/03	Tue 8/5/03	190	\$0	\$0	\$0	CESAJ-EN-DT
192	2.07.3.7.5.25	Prepare Contracting Documents	30 d	Wed 8/6/03	Wed 9/17/03	191	\$0	\$0	\$0	SAJ-EN-DT, CESAJ-EN-T
193	2.07.3.7.5.26	Issue Notice to Proceed	5 d	Thu 9/18/03	Wed 9/24/03	192	\$0	\$0	\$0	CESAJ-CT-C
194	2.07.3.7.5.27	Survey Sites	120 d	Thu 9/25/03	Fri 3/19/04	193	\$375,000	\$0	\$375,000	CESAJ-EN-DT
195	2.07.3.7.5.28	QA/QC Data	15 d	Mon 3/22/04	Fri 4/9/04	194	\$0	\$0	\$0	CESAJ-EN-DT
196	2.07.3.7.5.29	Prepare Metadata	1 d	Mon 4/12/04	Mon 4/12/04	195	\$0	\$0	\$0	CESAJ-EN-DT
197	2.07.3.7.5.30	Post Metadata	1 d	Tue 4/13/04	Tue 4/13/04	196	\$0	\$0	\$0	CESAJ-EN-DT
198	2.07.3.7.5.31	Complete Surveys	0 d	Tue 4/13/04	Tue 4/13/04	197	\$0	\$0	\$0	CESAJ-EN-DT
199	<b>2.07.3.8</b>	<b>Support Data Implementation Plan</b>	<b>71 d</b>	<b>Mon 3/25/02</b>	<b>Tue 7/2/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$10,000</b>	
200	<b>2.07.3.8.1</b>	<b>Appoint Technical Leads</b>	<b>1 d</b>	<b>Mon 3/25/02</b>	<b>Mon 3/25/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
201	2.07.3.8.1.1	SAJ	1 d	Mon 3/25/02	Mon 3/25/02	17	\$0	\$0	\$0	CESAJ-DR-P
202	2.07.3.8.1.2	SFWMD	1 d	Mon 3/25/02	Mon 3/25/02	17	\$0	\$0	\$0	SFWMD
203	2.07.3.8.2	Identify Support Data	10 d	Tue 3/26/02	Mon 4/8/02	202	\$0	\$0	\$0	SFWMD
204	2.07.3.8.3	Prepare Plan	30 d	Tue 4/9/02	Mon 5/20/02	203	\$0	\$10,000	\$10,000	SFWMD
205	2.07.3.8.4	Post on Web for Comments	10 d	Tue 5/21/02	Tue 6/4/02	204	\$0	\$0	\$0	SFWMD
206	2.07.3.8.5	Incorporate Comments	10 d	Wed 6/5/02	Tue 6/18/02	205	\$0	\$0	\$0	SFWMD
207	2.07.3.8.6	Plan Approval	10 d	Wed 6/19/02	Tue 7/2/02	206	\$0	\$0	\$0	SFWMD
208	2.07.3.8.7	Implement Plan	0 d	Tue 7/2/02	Tue 7/2/02	207	\$0	\$0	\$0	SFWMD
209	<b>2.07.3.9</b>	<b>Information Technology Plan</b>	<b>104 d</b>	<b>Fri 3/22/02</b>	<b>Mon 8/19/02</b>		<b>\$0</b>	<b>\$0</b>	<b>\$60,000</b>	
210	2.07.3.9.1	Initiate Plan	0 d	Fri 3/22/02	Fri 3/22/02	33	\$0	\$0	\$0	SFWMD
211	2.07.3.9.2	Develop Alternatives	30 d	Mon 3/25/02	Fri 5/3/02	210	\$10,000	\$10,000	\$20,000	SFWMD, CESAJ-IM-I
212	2.07.3.9.3	Screen Alternatives	10 d	Mon 5/6/02	Fri 5/17/02	211	\$10,000	\$10,000	\$20,000	SFWMD, CESAJ-IM-I
213	2.07.3.9.4	Select Feasible Alternatives for Further Evaluation	5 d	Mon 5/20/02	Fri 5/24/02	212	\$0	\$0	\$0	SFWMD, CESAJ-IM-I
214	2.07.3.9.5	Scope Alternatives & Prepare ROI	30 d	Tue 5/28/02	Tue 7/9/02	213	\$10,000	\$10,000	\$20,000	SFWMD, CESAJ-IM-I
215	2.07.3.9.6	DCT Recommend Approval	21 d	Wed 7/10/02	Wed 8/7/02	214	\$0	\$0	\$0	SAJ, SFWMD
216	2.07.3.9.7	CRG Approval	1 d	Thu 8/8/02	Thu 8/8/02	215	\$0	\$0	\$0	SFWMD

# CERP Data Management Plan

ID	WBS	Task Name	Dur	Start	Finish	Pred.	SAJ	SFWMD	Total Cost	Responsible Office
217	2.07.3.9.8	PRB Approval	7 d	Fri 8/9/02	Mon 8/19/02	216	\$0	\$0	\$0	SAJ
218	<b>2.07.4</b>	<b>Phase III - Long-term Needs</b>	<b>400 d</b>	<b>Tue 8/20/02</b>	<b>Wed 3/24/04</b>		<b>\$0</b>	<b>\$0</b>	<b>\$4,000,000</b>	
219	2.07.4.1	Implement Recommended Plan	400 d	Tue 8/20/02	Wed 3/24/04	217	\$2,000,000	\$2,000,000	\$4,000,000	SFWMD, CESAJ-IM-I
220	<b>2.07.5</b>	<b>Phase IV - Full Implementation</b>	1 d	Thu 3/25/04	Thu 3/25/04	219	\$0	\$0	\$0	
221	<b>2.07.6</b>	<b>Phase V - Update and Maintain</b>	8880 d	Fri 3/26/04	Mon 9/20/38	220	\$0	\$0	\$0	

**TABLE 4**  
**GENERAL DATA STANDARDS**

**Spatial Framework**

- Horizontal Datum: North American Datum of 1983 (NAD 83)
- Vertical Datum: North American Vertical Datum of 1988 (NAVD 88).
- Map Projection
- Units of Measure
- Geodetic Control: The National Spatial Reference System (NSRS). Control networks for topographic, construction and other surveys for CERP should have at least four ties occupying at least three quadrants to the NSRS.
- Projection: State Plane Coordinate System, Florida East Zone.
- Units: U.S. Survey feet.
- Conversion Software: Local VERTCON based on local geoid (when available and appropriate).

**Data Format**

- ArcInfo Coverage
- ArcView Shape File
- AutoCAD DWG file
- MicroStation DGN file
- ESRI SDE
- ORACLE Spatial
- Oracle Time Series

**Controlled Vocabulary**

- South Florida Gazetteer
- Key Word Thesaurus
- Theme Thesaurus

**Aggregation and Vertical Integration**

- FL Standards and Statutes
- FGDC Standards
- ANSI/ISO Standards
- A/E/C CADD Standards
- NOAA Meteorological Standards
- USGS Hydrologic Standards
- FDEP Water Quality Standards

**Data Collection and Content Standards**

- USACE Engineer Manuals
- Spatial Data Standards for Facilities, Infrastructure and Environment
- FGDC-STD-009-1999 Content Standard for Remote Sensing Swath Data
- FGDC-STD-008-1999 Content Standard for Digital Orthoimagery
- Florida Property and Boundary Surveying Statutes
- Florida Minimal Technical Standards for Surveying and Mapping Accuracy

- FGDC-STD-007.3-1999 The National Standard for Spatial Data Accuracy Documentation
- FGDC-STD-001-1998 Content Standard for Digital Geospatial Metadata (v2.0)
- FGDC-STD-001.1-1999 CSGDM, Part 1: Biological Profile
- Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing
- Surveying/Mapping Engineering Manuals
- EM-1110-1-1000 Photogrammetric Mapping
- EM-1110-1-1002 Survey Markers and Monuments
- EM-1110-1-1003 NAVSTAR Global Positioning System Surveying
- EM-1110-1-1004 Deformation Monitoring and Control Surveying
- EM-1110-2-1003 Hydrographic Surveying
- EM-1110-2-2909 Geospatial Data and System
- EP-110-1-6a&6b Sign Standards Manual

**TABLE 5**

**CERP CADD STANDARDS**

Version 1.0



All work done in conjunction with the CERP will use the Tri-Service A/E/C CADD Standards Release 2.0 (CADD Standards) and the Spatial Data Standards for Facilities, Infrastructure, and Environment Release 2.0 (SDSFIE) or later. This is in accordance with the Master Project Management Plan (MPMP) Volume 1, Paragraph 4.7, page 53. As indicated below, these standards will provide a number of benefits to all parties involved with the CERP.

- The purpose for the standards are as follows:
  - Any time you have to move data from one cadd package to another you face a number of challenges. These include line code and color problems, fonts issues, and line weight problems. If you are coming from a standard for all you drawings then a batch translation is much more likely to be a success. This is essential when moving data from one platform to another, for example from MicroStation to ArcGis. If a cadd drawing does not follow a standard then bringing that data into a GIS become very problematic.
  - One other area that standards help is when common A/E Contractual requirements are needed. If all governmental parties specify the same standards in their procurements then all CERP data will be in compliance.
  - *Where do you get the standards?* The CADD Standards may be downloaded from the internet at: <http://tsc.wes.army.mil>
- There are many choices to be made by CADD users even when using the CADD Standards. In this section we hope to clear up some ambiguity in the standards and make them easier to implement.
  - To have consistency with the CERP and CADD files some choices will be defined by this document.
    - Level/layer naming will be in conformance with the ISO format for layer/level naming as discussed in chapter 4 of the standards.
    - The CADD Standards address a file naming convention for cadd drawings for both model and sheet files. The optional 20 character Project Code addressed in the CADD Standards will be used by each entity creating CADD data for the CERP. This will allow the user to adapt their current system of managing files to work with CERP cadd data.
    - At time of “publication” of a sheet file from cadd, the document shall be in conformance with the CERP Document Filing Codes. “Publication” being when the finished cadd file is sent to a hardcopy device or into another electronic format such as pdf.
    - Sheet sizes for cadd drawings shall be as called for in the contract for design services.
- The level/layer assignments for each discipline can be confusing at first glance. To illustrate the move from an existing system to the CADD Standards the surveying/mapping civil.dwg layer assignment used by the South Florida Water Management District is shown below converted to the CADD Standard level/layer guidelines. The column labeled CERP shows the layer name while the column Appn. A

“A pg.” indicates the page in Appendix A of the CADD Standards the information should reside. As can be seen from the table, where one file was used in the past, now different model files will be used to hold the data collected.

Civil.dwg	CERP	Appn. A pg.	Level	pen no.	Notes
0				7	
10CONTOUR	V-TOPOMJM	A9	42	3	
1CONTOUR	V-YOPOMNM	A9	44	1	
5CONTOUR	V-TOPOMJM	A9	44	2	
ACQL	C-PROPCOM	A26	26	5	
ACQLTXT	C-PROPIDM	A26	28	7	
BASINBDY	C-STRMLAM-	A36	20	6	Local town drainage basin
BASINTXT	C-STRMRIM-	A36	19	7	Text for the above
BORDER	G-___TTP	A3	10	5	
BORTEXT	G-___TEP	A3	7	7	
CANBL	V-SURVLIM	A8	9	1	
CANCL	V-CHANCIM	A10	19	1	
CANRWL	V-PROPRWM	A11	27		
CANTXT	V-___TEP	A11	7	7	
CATV	V-COMMOVM	A13	11	1	
CITIESROADS	V-PVMTIDM	A8	35	1	
COBDY	V-PROPESM	A11	25	6	
COBNYTXT	V-PROPIDM	A11	28	7	
DISTBDY	V-PROPESM	A12	25	6	
DISTTXT	V-PROPIDM	A12	28	7	
ELECL	V-PRIMOVIM	A12	11	1	
ELEVTEXT	V-PRIMOIM	A12	12	7	
EOW	V-TOPOSHM	A10	45	5	
ESMT	V-PROPESM	A11	25	4	
ESMTTXT	V-PROPDIM	A11	28	7	
FEDOWN	V-PROPLIM	A11	26	5	
FEDTEXT	V-PROPDIM	A11	28	7	
FEDTXT	V-PROPDIM	A11	28	7	
FENCE	V-SITEFEM	A8	13	1	
FREDDY	G-----SYP-	A3	6	3	SFWMD Logo - moves to border sheet
GASL	V-UTILNGM	A8	27	1	
GOVTLOTS	V-PROPESM	A11	25	5	
GRANTS	V-PROPLIM	A11	26	5	
HCONT	V-SURVDAM	A8	8	3	
LEVBL	V-SURVLIM	A8	9	2	
LEVCL	V-CHANCIM	A10	19	1	
LEVRWL	V-PROPRWM	A11	27	4	

LEVTEXT	V-----TEP-	A11	7	7	
LOCALOWN	V-PROPESM	A11	25	4	
LOCALTEXT	V-PROPIDM	A11	28	7	
LOGO	G-SYP	A3	6	7	
MUNBDY	V-PROPESM-	A11	6	6	
MUNTEXT	V-PROPIDM-	A11	28	7	
NOLOT	V-NNP	A8	3	1	
PLATLOT	V-PROPLIM	A11	26	2	
PLATTEXT	V-PROPIDM	A11	28	7	
PRIVOWN	V-PROPLIM	A11	26	2	
PRIVTEXT	V-PROPIDM	A11	28	7	
PROFLELINE	V-GRADEXM	A23	44	3	
PROPACQ	V-PROPLIM	A11	26	5	
PROPTXT	V-PROPIDM	A11	28	7	
RDBL	V-ALIGNLIM	A26	9	2	
RDCL	V-SURVLIM	A8	9	1	
RDRWL	C-PROPRWM	A26	27	3	
RDTEXT	C-PROPIDM	A26	28	7	
RDTOPO	C-PVMTROM	A26	34	2	
RDTEXT	C-PVMTIDM	A26	35	7	
RIVCL	V-CHANCIM	A10	35	1	
RRRWL	C-PROPRMW	A26	27	3	
RRTXT	C-PROPIDM	A26	28	7	
SECLCOGO	V-PROPSEM	A11	22	2	
SECLDIG	see the SDSFIE			1	Section Line digitized - not survey grade
SECOR	V-SYP	A11	6	1	
SECTXT	V-TEP	A11	7	7	
SEWERL	V-PROPRWM	A11	27	1	
SFWMDOWN	V-PROPESM-	A11	25	5	
SFWMDTEXT	V-PROPIDM-	A11	28	7	
SPOT	V-TOPOSPM	A9	48	1	
STATE	V-PROPLIM	A11	26	1	
STATEOWN	V-PROPLIM	A11	26	4	
STATETXT	V-PROPIDM	A11	28	7	
STORMSYS	V-UTILLIM	A11	30	1	
STRUCT	V-BLDGTM	A8	11	3	
STRUCTXT	V-BLDGIDM	A8	12	7	
TELE	V-COMMOVM	A13	11	1	
TEXT	V-TEP	A8	7	7	
TOB	V-TOPOSM	A9	49	1	
TOPOTEXT	V-TEP	A8	7	7	
TOPOTXT	V-----TEP-	A8	7	7	
TOS	C-TOPOSTM	A26	49	1	
TPOS	C-TOPOSTM	A26	49	1	

TRAIL	C-SITESTM	A26	20	2	
TRAVL	V-SURVLIM	A8	9	1	
TRAVTXT	V-SURVDIM	A8	10	7	
TREEL	V-SITEVEM	A8	22	1	
TREETYP	V-----TEP-	A11	7	1	
TWPRGDIG	CDPLSRNGLL			5	see the SDSFIE
UPLANDS	V-SURVLIM-	A11	9	5	"Safe uplands line" from DEP
UTILP	V-POLEUTM	A12	33	1	
UTILRWL	C-PROPRWM	A26	27	3	
UTILTXT	C-PROPIDM	A26	28	7	
VCONT	V-SURVDAM	A8	8	1	
VEG	V-SITEVEM	A8	22	1	
WATERL	V-UTILWAM	A8	25	1	
XGRID	V-GRIDMAM-	A23	48	7	
XSECL	V-GRADEXM-	A23	44	2	
XTEXT	V-GRIDTEM-	A23	51	7	

- If an entity (element) to be drawn in a CERP cadd file is not located in the CADD Standards, the user is directed to check the SDSFIE. If the entity is not found then the user is directed to contact the cadd manager POC's for resolution.
- If an entity (element) is to be drawn and is located in both the cadd and SDS with conflicting attributes (color, style, weight), the first priority is the cadd standards.
- Points of Contact (POC's)
  - The CADD Manager for the Jacksonville District Corps of Engineers and the South Florida Water Management District CERP CADD Manager are the Points of Contract (POC's) for any questions arising in conjunction with implementing these instructions. Any problems encountered with the CADD Standards, such as no layer/level assignments for an entity to be drawn, will be documented and referred to the POC's for resolution. The POC's will make a determination and post the resolution to the originator as well as on the CERP web site.
- A Procedures Manual is being developed to assist users in achieving the objectives of these standards. This manual will allow the reader to understand and resolve the "How do I ... " questions that come up in the day-to-day operation of cadd work as it pertains to the CERP. When completed the manual will be posted to the CERP web site. Instruction on how to request corrections or make additions to the manual will also be found on the web site.

**Table 6.**  
**Procurement Language for Acquiring Geospatial Data for CERP**

The purpose of this document is to provide guidance on procuring geospatial data to ensure that data is collected consistently throughout the CERP projects and programmatic activities and in concert with other government agencies. The intent to provide guidance on acquiring geospatial data consistent with Federal Geographic Data Committee (FGDC) standards and activities. Geospatial data is defined as data referenced, either directly or indirectly, to a location on the earth.

While the topics and concepts outlined here apply to all geospatial data, the language provided is meant as an example. The Contracting Office Technical Representative (COTR) needs to consider the purpose of the data collection and tailor example language to reflect the specific data collection activity. The examples provided are meant to augment the contract verbiage and are not comprehensive. Geospatial data collection contracts should always reflect the purpose of the data collection activity. This means taking into consideration, first and foremost, the purpose of the data collection activity when writing a contract – not all geospatial data collection activities have equivalent requirements –data analysis, mapping, image acquisition, planning studies, construction, etc. At the same time, the spatial data collected by individual CERP activities becomes part of a program-wide collection of data that will be used and reused by others for regional assessment, modeling and other purposes. This constrains the individual activities to satisfy their data needs within the spatial framework and content standards established for CERP. Establishment of standard boilerplate for procurement is an effective way to ensure a degree of compliance with these standards. An additional benefit is time savings in the scoping process that each individual Project Delivery Team (PDT) must go through. This standardization also provides opportunities for efficiency to the A&E contractor community that actually collects most of our data.

## **Background Information**

### **1. Introduction**

Over the past few years, there have been many changes in the way state and federal governments procure technology. Many of these changes have affected and continue to affect the procurement of geospatial information and geospatial processing capabilities.

The following forces have driven these changes:

- a. The need to move away from expensive and difficult-to-maintain unique solutions, and toward Commercial-Off-The-Shelf (COTS) and Standards-based COTS (SCOTS) for reasons of lower life cycle costs, and upward compatibility with future generations of software in the commercial mainstream.
- b. The need to share information between components of the Government, and corresponding needs to conform to existing and emerging standards for the discovery and access of geospatial information, and standards for the representation and labeling of geospatial features and relationships.
- c. The need to avoid wasteful duplication of effort, and promote effective economic management of resources by Federal, State, local, and tribal governments.

## **2. US Policy on Information Systems and Spatial Data**

The US policy on spatial data is set forth in three Office of Management and Budget Circulars (OMB A16, OMB A119 and OMB A130) and by presidential Executive Order 12906.

### **A. OMB Circular A16**

OMB Circular A16 describes the responsibilities of Federal agencies with respect to coordination of those Federal surveying, mapping, and related spatial data activities described below. Spatial data are geographically referenced features that are described by geographic positions and attributes in an analog and/or computer-readable (digital) form. A major objective of this Circular is the eventual development of a national digital spatial information resource, with the involvement of Federal, State, and local governments, and the private sector. This national information resource, linked by criteria and standards, will enable sharing and efficient transfer of spatial data between producers and users. Enhanced coordination will build information partnerships among government institutions and the public and private sectors, avoiding wasteful duplication of effort and ensuring effective and economical management of information resources in meeting essential user requirements. The coordinating procedures established by this Circular extend to all activities financed in whole or in part by Federal funds.

### **B. OMB Circular A119**

OMB Circular A119 concerns federal participation in the development and use of voluntary consensus standards and in conformity assessment activities. This Circular establishes policies to improve the internal management of the Executive Branch. This Circular directs agencies to use voluntary consensus standards in lieu of government unique standards except where inconsistent with law or otherwise impractical. It also provides guidance for agencies participating in voluntary consensus standards bodies and describes procedures for satisfying the reporting requirements in the Act. The policies in this Circular are intended to reduce to a minimum the reliance by agencies on government-unique standards.

Many voluntary consensus standards are appropriate or adaptable for the Government's purposes. The use of such standards, whenever practicable and appropriate, is intended to achieve the following goals:

- a. Eliminate the cost to the Government of developing its own standards and decrease the cost of goods procured and the burden of complying with agency regulation.
- b. Provide incentives and opportunities to establish standards that serve national needs.
- c. Encourage long-term growth for U.S. enterprises and promote efficiency and economic competition through harmonization of standards.
- d. Further the policy of reliance upon the private sector to supply Government needs for goods and services.

Agencies must consult with voluntary consensus standards bodies, both domestic and international, and must participate with such bodies in the development of voluntary consensus standards when consultation and participation is in the public interest and is compatible with their missions, authorities, priorities, and budget resources.

### **C. Circular No. A-130**

Circular No. A-130 provides uniform government-wide information resources management policies. This Circular establishes policy for the management of Federal information resources. Procedural and analytic guidelines for implementing specific aspects of these policies are provided, and these essentially mandate prudent and proper behavior in the acquisition, capturing, and generation of information of all types. The policies in the Circular apply to the information activities of all agencies of the executive branch of the Federal government.

The Paperwork Reduction Act establishes a broad mandate for agencies to perform their information resources management activities in an efficient, effective, and economical manner.

### **D. Executive Order 12906 Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure**

This Executive Order states that geographic data is critical to promote economic development, improve stewardship of natural resources, and protect the environment. Modern technology now permits improved acquisition, distribution, and utilization of geographic (or geospatial) data and mapping. The National Performance Review has recommended that the executive branch develop, in cooperation with State, local and tribal governments, and the private sector, a coordinated National Spatial Data Infrastructure (NSDI) to support public and private sector applications of geospatial data in such areas as transportation, community development, agriculture, emergency response, environmental management, and information technology. The Executive order establishes a Federal Geographic Data Committee to undertake data standards activities, and to develop standards for implementing the NSDI, consistent with OMB Circular No. A-119. The Federal Geographic Data Committee (FGDC) is authorized under OMB Circular A16 to coordinate the development of geographic data standards within the U.S., engaging both federal and nonfederal participation. Standards for spatial data exchange and documentation (metadata) have been developed and approved through the FGDC. The Federal Geographic Data Committee has Thematic Subcommittees that are defining information content for more than a dozen categories of spatial information.

## **II. Description/Specifications/Statement of Work**

**1.General** Complete geospatial data is defined as having all the parts: spatial, attribute information and metadata. Depending upon the complexity/purpose content data will vary in importance. Obviously, spatial component is necessary by definition. The metadata component is mandatory regardless of purpose.

Example Language:

The contractor will provide complete geospatial data including a spatial component, content information and metadata. This data shall be in compliance with all of the following that apply:

EM-1110-1-1000 for Photogrammetric Mapping

EM-1110-1-1002 Survey Markers and Monumentation

EM-1110-1-1003 NAVSTAR Global Positioning System

Surveying

EM-1110-1-1004 Deformation Monitoring and Control  
Surveying  
EM-1110-1-1005 Topographic Surveying  
EM-1110-2-1003 Hydrographic Surveying  
EM-1110-1-2909 Geospatial Data and System  
Spatial Data Standards for Facilities, Infrastructure  
and Environment (SDSFIE).

The spatial component of the data will conform to the  
CERP Common Spatial Framework as defined in Section  
9.6 of the Data Management Project Management Plan.

**2. Content** A data content standard provides semantic definitions for a set of real world geographic objects of significance to a community. This is often difficult to standardize because each community defines different significant objects. The Spatial Data Standards for Facility Infrastructure and Environment (SDSFIE) provides a dictionary of standard feature and attribute definitions structured as a set of related tables and schemae. The SDSFIE is kept consistent with FGDC content standards by yearly revisions, and by the Center's participation in the FGDC standards process. If the contract is to collect feature data (building footprints, roads, etc), for which SDSFIE has a schema, then the contract should specify that the data be delivered with table names, attribute names and data types consistent with that schema as represented in the particular software being used.

Example Language:

The contractor will provide spatial data that conforms to the structure and terminology of the Spatial Data Standards for Facility Infrastructure and Environment (SDSFIE) version 2.1 for entity types <list varies with application>. A list of specific tables and their attributes will be provided in software and hard copy by the government. The SDSFIE provides a data model for FGDC content standards.

### **3. Documentation/Metadata**

Metadata or "data about data" describe the content, quality, condition, and other characteristics of data. The major uses of metadata are:

- To help organize and maintain an organization's internal investment in spatial data,
- To provide information about an organization's data holdings to data catalogues, clearinghouses, and brokerages, and
- To provide information to process and interpret data received through a transfer from an external source.

Generally, FGDC compliant metadata files need to be generated for "data sets". It may be reasonable for a contractor to generate one metadata file for an entire data collection effort. If the collection is completed in a short time is uniform; such as with a small aerial photography effort, one metadata file can be generated that adequately describes the data. On the other hand, a large complex data collection effort, over different geographic areas, probably needs multiple metadata files to adequately describe the data. The Government should work with the Contractor to determine an appropriate definition of "data set".



**Example Language:**

Any data, database(s) and/or information products (reports, etc.) produced through this procurement must be documented through the preparation of standard metadata (data about data) descriptions. Proposals shall clearly describe how this will be accomplished.

**Example Language:**

The contractor shall ensure that the metadata delivered is compliant with the Federal Geographic Data Committee Standard "Content Standard for Digital Geospatial Metadata", FGDC-STD-001-1998. A free copy of FGDC-STD-001-1998 is available at <http://www.fgdc.gov/metadata/contstan.html>. {Note: Reference appropriate endorsed Metadata Profile Standard i.e. "Biological Data Profile of the Content Standard for Digital Geospatial Metadata" FGDC-STD-001.1-1999 in place of FGDC-STD-001-1998 when applicable}. All applicable sections must be completed. The government will provide the contractor with example metadata appropriate for the data involved in this contract.

Metadata received from the contractor must be able to be imported and processed by the metadata parser (mp) software free of errors (see web site <http://geology.usgs.gov/tools/metadata/tools/doc/mp.html> for a free copy of the mp software). This may be achieved by using the Corpsmet95 metadata collection/generation tool. Corpsmet95 is available for download at <http://corpsgeol.usace.army.mil>. Other metadata authoring tools can be used at the contractor's discretion, as long as the resulting metadata text file passes mp without error.

**4. Accuracy** Accuracy is dependent upon the purpose and resolution of the data collection. There are five parts to the FGDC accuracy standard. All parts of the standard applicable to the collection effort shall be referenced in the contract. The standards are available at <http://www.fgdc.gov>. *Geospatial Positioning Accuracy Standard, Part 4: Architecture, Engineering, Construction, and Facilities Management* is consistent with accuracy information described in EM 1110-1-2909.

**Example Language:**

The Contractor will provide data consistent with FGDC: *Geospatial Positioning Accuracy Standard, Part 1, Reporting Methodology FGDC-STD-007.1-1998*  
*Geospatial Positioning Accuracy Standard, Part 2, Geodetic Control Networks FGDC-STD-007.2-1998*

*Geospatial Positioning Accuracy Standard, Part 3,  
National Spatial Data Accuracy Standard FGDC-STD-  
007.3-1998*

*Geospatial Positioning Accuracy Standard, Part 4:  
Architecture, Engineering, Construction, and  
Facilities Management (Draft Standard)*

*Geospatial Positioning Accuracy Standard, Part 5:  
Navigation Charts and Hydrographic Surveys (Draft  
Standard)*

Accuracy statements reported by the contractor shall be completely and thoroughly substantiated by metadata. The National Standard for Spatial Data Accuracy (NSSDA) provides guidelines in Section 3.2.3, Accuracy Reporting, for reporting positional accuracy in metadata. The contractor shall ensure that the metadata is compliant with the Federal Geographic Data Committee Standard Content Standard for Digital Geospatial Metadata, FGDC-STD-001-1998, which is downloadable from <http://www.fgdc.gov/metadata/contstan.html>.

**5. Transfer/Format** Contract should indicate the software and media formats required for spatial data deliverables. The goal is to facilitate, as much as possible, the direct and immediate use of the data for its primary purpose by those requesting it.

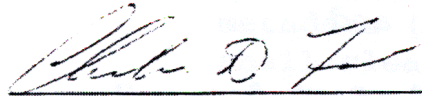
Example Language:

All data shall be provided on recordable compact disk (CD-R) in ISO 9660 format.

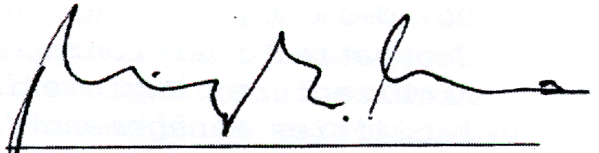
The dataset of planimetric features will be delivered as untiled ArcGIS coverages or shapefiles, Microstation design files (DGN) and AutoCAD drawing (DWG) files, as produced by the most recent supported version of these packages. These will be placed in separate directories named "arc", "ustation" and "acad". They will include all reference files, survey control, flight lines, accuracy worksheets and metadata necessary to review each CD as a stand-alone deliverable without reference to other materials. They will be free of conversion artifacts, and all processing steps documented in the metadata submitted with each format.

## Approval Log

### FOR THE PROJECT DELIVERY TEAM:

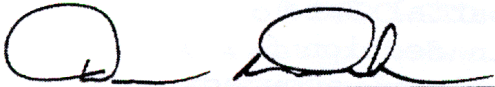


CHARLES D. FALES  
USACE, Project Manager, SAJ



RICHARD R. MIESSAU, II  
SFWMD, Project Manager

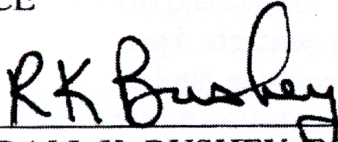
### FOR THE DESIGN COORDINATION TEAM:



DENNIS R. DUKE, P.E.  
Chief, Restoration Program Division  
USACE

3/8/02

Date

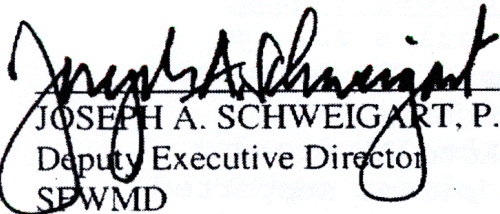


RANDALL K. BUSHEY, P.E.  
Assistant Deputy Executive Director  
SFWMD

7 Mar 02

Date


### FOR SFWMD:



JOSEPH A. SCHWEIGART, P.E.  
Deputy Executive Director  
SFWMD

3/11/02

Date



HENRY DEAN  
Executive Director  
SFWMD

3/12/02

Date

### FOR THE PROJECT REVIEW BOARD, USACE:



RICHARD E. BONNER, P.E.  
Deputy District Engineer  
for Project Management

3/22/02

Date